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Original Communications.

On the Element in the Etiology of Joint-
Analysis of Eight Hundred and Sixty

GIBNEY, M. D., Assistant Surgeon to
the Ruptured and Crippled, New York.

subject the terms of which are so difficult
is attended, I am free to confess, to
assessment. Americans, as a rule, are in-
with any degree of allowance a mention
strumous diathesis. The question of its
ly in the face, and a definition based on
manded. When I see in standard Amer-
y, and in the reports of society proceed-
so-called" prefixed to struma, or scrof-
e of the term becomes necessary, I feel
e any theories, and consequently shall
have to make on purely clinical obser-

that many of our older physicians and
ously to a continued recognition of the
and I am also aware that some of the
riters on practice and pathology, in this

country and abroad, recognize its existence. I have only to cite such names as those of Rindfleisch, of Ruehle, of Billroth, of Erichsen, of William Adams, of Gross, of Ashurst, of Delafield, and of many others.

A six years' service as *interne* in a hospital unsurpassed in opportunity for clinical observation, enables me to invite discussion at least, not on theories—for I have no special theory to establish—but on some points elicited by a careful analysis of a large number of cases, the records of which are taken from the Hospital for the Ruptured and Crippled. During my long sojourn among the truly afflicted I have had frequent occasion to question and to gravely doubt many a fine-spun theory advanced in current literature. Without any sense of egotism, I take occasion, in this connection, to refer to impressions made on the mind of James Henry Bennett, found in his monograph on "Pulmonary Consumption." He reverts to two years of his early life spent in charge of a scrofulous ward of the Hospital of St. Louis, in Paris, where were eighty young females, from fifteen to twenty years of age, nearly all of whom had glandular swellings, with or without scrofulous disease of the bones, ankles, knees, or elbows. He pathetically closes the paragraph with, "a sad assemblage these poor girls were." It is impossible for a physician to be long connected with a dispensary or hospital in a large city without coming to the conclusion that some vice, either hereditary or acquired, must underlie the constitutions of the vast majority of the poor who seek medical assistance. In one instance, the shape and configuration of the head attract your attention; in another, the peculiar expression of the eye, the hue of the face, the irregularity of the teeth; in another instance, the contour of the chest, the general carriage, etc., etc. It is difficult, in fact, to predicate strumous of one particular type of expression. Some children who are undoubted subjects of this diathesis have light hair, and some have dark hair; the skin in some is almost transparently light, in others it is very dark.

I believe I am safe in stating that all authors, with one or two exceptions, regard as synonymous the adjectives strumous and scrofulous. *Æsthetically*, I prefer the former, and shall consequently use the term scrofulous as infrequently as possi-

ble. What, then, is meant by the strumous diathesis? While searching for something definite in this connection, I chanced to meet with a lecture on "Phthisis Pulmonalis" by my instructor in pathology, Dr. Francis Delafield;¹ and, as the doctor is not noted for verbosity, I shall take this opportunity of quoting the following paragraph:

"Of scrofula we see so little in this country that it is difficult for us to appreciate the prominent place it holds in the minds of physicians in European countries. It is a condition which is hardly susceptible of a definition, and yet it is not hard to understand what is meant by the term. It means this: when an individual acquires an inflammation of a mucous membrane, of the skin, of the joints, of the bones, of the genito-urinary apparatus, or of almost any part of the body, such an inflammation usually runs an acute course and terminates in resolution, or in suppuration, or in the formation of organized new tissue. But, if the inflammation, instead of doing this, simply reaches a certain point and stays there, and then, instead of resolving or of suppurating merely, goes through a succession of degenerative changes, such an inflammation is said to be scrofulous. The scrofulous inflammations have several well-marked characteristics. They are very slow in their progress; they are very rebellious to treatment; they are accompanied by an extensive cellular infiltration of the inflamed parts, so that when the degenerative changes ensue there is large destruction of tissue. The degeneration which occurs in the products of such a scrofulous inflammation is peculiar in its nature; it is commonly called cheesy degeneration, and consists in the transformation of the products of inflammation into a dry, yellow mass, composed of amorphous granular matter. Examples of this form of inflammation will at once occur to you. Caries of the vertebræ, hip-joint disease, white swelling of the knee-joint, scrofulous orchitis, and enlarged lymphatic glands, are all of frequent occurrence."

This embraces one of the two marked characteristics, "per- tinacity," described by Virchow,² without reference to the other characteristic, "vulnerability;" it includes the definition of the College of Physicians, "a constitutional disease, resulting either in the deposit of tubercle or in specific forms of inflammation or ulceration,"³ without entering into the vexed question of "scrofula with tubercle" *versus* scrofula without tubercle. Let me, to include the vulnerability and the age in

¹ *Medical Record*, vol. x., p. 338.

² "Die krankhaften Geschwülste, B. ii., H. ii., pp. 587, 603.

³ "St. George's Hospital Reports," vol. iv., p. 142.

which the cachexia is most frequently observed, quote the definition given by Haward, in a very instructive paper in the fourth volume of "St. George's Hospital Reports," on an "Analysis of One Hundred and Thirty-four Cases of Chronic Bone and Joint Disease." He thinks it should be confined to that diathesis which is so prone to chronic inflammation of all kinds, and frames the following: "Scrofula is a disease of children, which manifests itself by a peculiar vulnerability, and proneness of the subject to chronic inflammations of the mucous membranes and skin, lymphatic system and bones, which inflammations are characterized by great pertinacity, and the products of which have a retrograde tendency."

Concerning the causation of the diathesis, and the development of the cachexia, a discussion at this juncture is unnecessary, as my analysis will bear directly on these two points. Dr. David Prince, of Illinois, has recently contributed some "Considerations in Relation to Diseases of the Joints,"¹ and he speaks of a condition which may be inherited and permanent, acquired and permanent, or acquired and temporary. Now, to that condition, as embodied in the definitions I have already given, I shall for convenience' sake apply the name "strumous," and by the terms of my theme it will be seen that I recognize some such factor in the production of a large proportion at least of diseases of the joints.

The two great theories to-day are traumatism and non-traumatism, and each has warm advocates. Some contend that every case of joint-disease is local, and is produced directly by a fall or other injury; while others contend that falls have very little to do in the causation of such—that the disease is constitutional, and is purely strumous. Some even go so far as to affirm that joint-diseases are always tubercular. Now, it seems to me that there is an immense amount of logomachy crowded into the literature on this subject. To say that a certain disease is traumatic, means to one mind that a fall or injury was the only cause, and to another mind it means that other and more important conditions were present, while the fall served simply to develop the disease in a system already predisposed. My impression is that the most extreme

¹ *American Practitioner*, February, 1877.

of the traumatists believe that, in the vast majority of instances, a predisposition exists, and the fall is only the exciting cause. The question has often been raised, whether a child in perfect health, and with no diathesis or dyscrasia either hereditary or acquired—whether such a child can get Pott's disease or hip-joint disease from an injury, however slight or however severe. Among my cases which I am to analyze, I propose to look carefully for such instances, if they can be found.

I have succeeded in collecting tolerably full notes of eight hundred and sixty cases, and in eight hundred and thirty-two an attempt has been made by the different historians to ascertain the existence or non-existence of an injury, however slight, to account for the disease in every case.

A word or two in reference to falls, and the influence they have on the minds of both laymen and professional men, may not be amiss in this connection. About the first question propounded by the anxious parent when a child with suspected joint-disease is brought to a physician is, "Doctor, do you think it came from a fall?" That question seems paramount to all others. I have often wondered why the maternal instinct did not suggest the all-important question as to what will cure the child. Generally, by the time a physician has been consulted, the history as to traumatism has been thoroughly investigated—the child has been induced, either by fear or by love, to admit the possibility of some fall on the sidewalk, on the ice, or down a flight of stairs. If the unfortunate victim cannot remember such an occurrence, some Argus-eyed neighbor calls in to volunteer testimony on the subject, so that there can be no excuse for a doctor omitting this item in getting a history. When I have been able conscientiously to assure a mother overburdened with responsibility that the disease has not arisen from a fall, the expression of joy and of gladness that often illuminates her face is something truly delightful. I think it will be fair to state that most of the histories, the data from which form the basis of this paper, have been taken by men who have emerged from colleges thoroughly imbued with the idea that traumatism produced a very large proportion of all the chronic arthropathies.

Among joint-diseases I have included caries of the vertebræ, and, consequently, this is included in my analysis. Of the eight hundred and sixty cases, then, I find that in twenty-eight no statement is recorded as to the exciting cause. In three hundred and forty-nine a fall or other injury was found to account for the disease; but, in looking more closely into the histories, I find that some did not develop until a period varying from six to eighteen months after the assigned injury; while, on the other hand, some developed in an incredibly short space of time. For instance, in some cases of caries of the vertebræ, I find that the history states that a fall occurred on a certain date, and on a certain other date, two or three days intervening, a small projecting knuckle was first discovered. I am not referring to fractures of the spine, but simply caries. I have myself ample reason for doubting ninety-seven of these cases, so far as the existence of the recorded exciting cause is concerned. This would leave, then, two hundred and fifty-two undoubtedly traumatic—this term, of course, as I have before intimated, being used advisedly. Twenty-nine per cent. come under this class, or, allowing the ninety-seven doubtful to be included, the percentage then becomes forty and one-half. In my analysis I shall endeavor to show what proportion of these traumatic cases were rendered thus vulnerable by a strumous diathesis or cachexia. In four hundred and eighty-three no cause such as a blow, fall, or other injury, could be ascertained. I have gone over these cases again and again, with much care, and am prepared to state the number wherein a strumous element is found. Just here I wish to express my unreserved thanks to Drs. J. W. Crenshaw and E. F. Horst, two of my associates in the hospital, for their untiring energy in assisting me to complete in tabular form the statistics which I have to record. The labor requisite for such an undertaking can only be fully appreciated by those who have had a personal experience. I have also received material aid from Dr. James Knight, in whose service as Resident Physician and Surgeon the whole number of cases have been observed. He has suggested many an interesting point, which I have taken pleasure in investigating by the light of clinical experience.

Before proceeding to the question of diathesis, I shall present some figures bearing on the sex, inasmuch as many authors have based arguments on the preponderance of one or the other, to sustain one or the other of the two theories. To give more weight to the argument, I have taken a larger number of cases, which includes the whole number found on the records of the Hospital, both in the in and out door departments.

TABLE I.—*Showing the Whole Number of Joint-Diseases, arranged with Reference to Sex.*

| FROM 1864 TO 1877. | Whole Number. | MALES. | | FEMALES. | |
|--------------------------|---------------|---------|-----------|----------|-----------|
| | | Number. | Per Cent. | Number. | Per Cent. |
| Caries of vertebræ. | 2,455 | 1,329 | 54 | 1,126 | 46 |
| Hip-disease. | 1,818 | 909 | 50 | 909 | 50 |
| Synovitis. | 1,188 | 670 | 56½ | 518 | 43½ |
| Totals. | 5,461 | 2,908 | 53½ | 2,553 | 46¾ |

From the above table it will be seen that, in five thousand four hundred and sixty-one cases of disease affecting the various joints, the male sex were represented two thousand nine hundred and eight times, and the female two thousand five hundred and fifty-three.

Dr. Louis Bauer,¹ among others who oppose bitterly the strumous theory, argues, with the flourish, “needs no special comment,” from the fact that boys are more subject to joint-diseases than are girls, that, consequently, the causation must be found in traumatism and not in a strumous diathesis. Boys are stronger and more robust, engage more in out-of-door exercises, which expose them to injuries, while girls lead more of an in-door life, are more sedentary in their habits of life, and are consequently more exposed to a strumous diathesis.

From such reasoning he adduces what may strike some, who are not furnished with facts, as a powerful argument. I

¹ “Orthopædic Surgery,” pp. 232, 233.

have not time here to refer even to the articular diseases whose cause is attributed to a fall from a chair, a bed, to a strain while in bed, or a twist or turn on the floor; nor have I time to cite instances in families where little girls are considered by all who know them as perfect romps, while the delicate boy develops the disease in question; nor have I time to enter into a discussion as to the causation of struma, especially desirable in this connection, as the author just quoted regards struma and tubercle as identical. It would be interesting to learn how many children, whether girls or boys, acquire tubercle or struma *de novo*, by a sedentary life and confinement to the house. The table I have just given, so far as numbers are concerned, does not furnish an overwhelming sex argument. I have seen a great many paralytic children, have examined them with much care at various stages of the paralysis, and many have been under my observation for several years. I have seen them fall often, and frequently get severe bruises; and I have seen the injuries neglected time and again. No class of children, I presume, fall and tumble about more than these unfortunates. To see an arthropathy and an infantile paralysis associated in the same patient is with me a rarity; and, where such have been noted, I have been particular to make special record of the case. This point is so interesting, that I have collected a few figures which enable me to speak with some degree of confidence. During the past six years 845¹ cases of spinal paralysis in children under fourteen years of age have been examined at the Hospital, and of that number I am able to find four complicated with joint-disease. In three the joint-disease followed the paralysis, in one it preceded the paralytic attack. This one I have already reported in the *Philadelphia Medical Times*.²

Age is a predisposing cause—that is, the disease occurs more frequently at certain periods of life—and from this fact

¹ In the paper, as read, I had one thousand four hundred and forty cases, embracing a period of fourteen years; but, as I am not familiar with those recorded prior to 1871, I have concluded to refer only to those I have had an opportunity of myself observing.

² December 9, 1876, p. 102.

arguments are constructed to militate against a strumous diathesis in the etiology. As in Table I., I have included a larger number, the statistics of which are perfectly reliable, and will give more weight to whatever deductions it may be desirable to draw therefrom.

TABLE II.—Showing the Relative Ages of 5,461 Cases of Joint-Disease.

| FROM 1864 TO 1877. | Whole Num- ber. | UNDER 14 YRS. | | FROM 14 TO 21. | | OVER 21. | |
|------------------------------|-----------------------|---------------|------------------|----------------|------------------|--------------|------------------|
| | | Num- ber. | Per Cent. | Num- ber. | Per Cent. | Num- ber. | Per Cent. |
| Caries of vertebræ | 2,455 | 2,153 | 87 $\frac{3}{4}$ | 180 | 7 $\frac{1}{2}$ | 117 | 4 $\frac{3}{4}$ |
| Hip-disease | 1,818 | 1,602 | 88 $\frac{1}{4}$ | 168 | 9 $\frac{1}{4}$ | 48 | 2 $\frac{1}{2}$ |
| Synovitis | 1,188 | 851 | 71 $\frac{3}{4}$ | 125 | 10 $\frac{3}{4}$ | 212 | 17 $\frac{1}{2}$ |
| Totals | 5,461 | 4,611 | 84 $\frac{1}{2}$ | 473 | 8 $\frac{3}{4}$ | 377 | 6 $\frac{3}{4}$ |

It will be seen from the above that eighty-four and one-half per cent. of the diseases of the joints occur prior to the fourteenth year. As bearing on disputed points, I have added another table of eight hundred and sixty cases, which will show the number under one year, under four years, etc. :

TABLE III.—Showing the Relative Ages of 860 Cases of Joint-Disease.

| LOCALITY. | Whole Num- ber. | To 1 Year | Per Cent. | To 4 Years. | Per Cent. | 4 to 14 Years. | Per Cent. | Over 14 Yrs. | Per Cent. |
|--------------------|-----------------------|-----------------|------------------|----------------|------------------|-------------------|------------------|--------------------|-----------------|
| Vertebræ | 296 | 10 | 3 $\frac{1}{2}$ | 195 | 65 $\frac{3}{4}$ | 85 | 28 $\frac{3}{4}$ | 16 | 5 $\frac{1}{2}$ |
| Hip | 360 | 4 | 1 $\frac{1}{4}$ | 139 | 38 $\frac{1}{2}$ | 215 | 59 $\frac{3}{4}$ | 6 | 1 $\frac{3}{4}$ |
| Knee | 140 | 7 | 5 | 71 | 50 $\frac{3}{4}$ | 65 | 46 $\frac{1}{2}$ | 4 | 2 $\frac{3}{4}$ |
| Ankle | 48 | 3 | 6 $\frac{1}{4}$ | 27 | 56 $\frac{1}{4}$ | 20 | 41 $\frac{3}{4}$ | 1 | 2 |
| Elbow | 6 | 2 | 33 $\frac{1}{3}$ | 4 | 66 $\frac{2}{3}$ | 2 | 33 $\frac{1}{3}$ | .. | .. |
| Shoulder | 5 | 1 | 20 | 3 | 60 | 2 | 40 | .. | .. |
| Wrist | 5 | .. | .. | 3 | 60 | 2 | 40 | .. | .. |
| Totals | 860 | 27 | 3 $\frac{1}{4}$ | 442 | 51 $\frac{1}{4}$ | 391 | 45 $\frac{1}{2}$ | 27 | 3 $\frac{1}{4}$ |

Before referring to the figures as shown by the above table, and as contributing to the subject of purely infantile disease of the joints, I have to state that in three cases the disease developed prior to the sixth month. Recent writers, I believe, make but very little reference to the disease occurring at so early a period of life. Coulson¹ states that Albers mentions three cases of congenital hip-disease, while Morgagni² observed the disease in an infant only a few months old. The youngest case among those I have analyzed was one of synovitis of the shoulder-joint in a female child two weeks of age.

In the discussion which followed the reading of this paper Dr. Jacobi raised the question as to why children were more frequently diseased than adults, and proceeded to apply the fact, that everything which had a rapid physiological development was apt to become pathological, to bone and joint diseases especially, claiming that those parts of a bone which had a rapid circulation of blood were the most frequently diseased. The upper portion of the femur was better supplied with blood-vessels than the lower portion, and it was a fact that, when we had to deal with disease of the bone in young children, the epiphysis was almost always the seat of the inflammation. He referred to the anatomical fact, also, that when man was born there was only a single epiphysis in which there was a single point of ossification, and that was the lower epiphysis of the os femoris—all the others being soft tissues. In the same degree that the epiphysis ossified, the doctor continued, the tendency to inflammation and supuration of the bone generally would be diminished. The remarks of both Dr. Hamilton and Dr. Jacobi on the different periods of life at which struma manifests itself, the different tissues affected, etc., were very interesting and highly instructive. As I have not space to incorporate the discussion fully into this paper, I shall refer my readers to a *verbatim* report of the same to be found in the *Medical Record* for April 28, 1877. It will be seen from Table III. that three and one-fourth per cent. of the cases of joint-disease occurred prior

¹ "On the Hip-Joint," etc., London, 1841, p. 61.

² "De Sedibus et Causis Morborum," epist. lvi.

to the beginning of the second year, while fifty-one and one-half per cent. developed prior to the fourth year. When it is remembered that a child under that age does not venture far from its nurse or mother, and is not so much exposed to the influence of traumatism as the child over four years of age, and when we take into account the theories just referred to, i. e., the one Dr. Jacobi referred to in the discussion, the non-strumous view, I think, fades into comparative insignificance. I shall not dwell specially on the different percentages in the table, but refer my readers to any figures thus tabulated in which they may feel interested.

Diathesis.—I shall now pass to the question of diathesis, and I have subdivided this into hereditary and acquired, the exact meaning of each to be developed by the diseases which I have found actually existing, and which may account for any morbid condition or dyscrasia capable of producing the lesions under consideration. To present this phase of my theme in a more tangible form, I shall give tables of caries of the vertebræ, of hip-disease, and of synovitis, from which to draw such conclusions as the figures therein shall warrant.

TABLE IV.—Giving 185 Cases of Caries of the Vertebræ analyzed with Reference to Hereditary and 209 with Reference to an Acquired Diathesis.

| EXCITING CAUSE. | Traumatic. | Non-traumatic. | Not sought. | Total. |
|--|------------|----------------|-------------|--------|
| Number analyzed..... | 77 | 106 | 2 | 185 |
| Percentage of cases where heredity was found..... | 71 | 80½ | .. | 76½ |
| Percentage of hereditary diseases as found in father..... | 35 | 35¾ | .. | 35½ |
| Percentage of hereditary diseases as found in mother..... | 41½ | 35¾ | 50 | 38½ |
| Percentage of hereditary diseases as found in both parents..... | 7¾ | 7½ | .. | 31¾ |
| Percentage of hereditary diseases as found in other children in family..... | 31½ | 33 | 50 | 15¾ |
| Percentage of hereditary diseases as found both in parents and children..... | 20¾ | 14½ | .. | 16¾ |
| Number analyzed..... | 72 | 131 | 6 | 209 |
| Percentage of cases where cause was found in acquired diathesis..... | 33½ | 52¾ | 33½ | 45½ |
| Percentage of cases where hereditary and acquired diathesis was found..... | 23¾ | 2¾ | .. | 22½ |

A word of explanation regarding the construction of the above table seems pertinent. My object in making the general division of "traumatic," "non-traumatic," and "not sought," was to bring out as prominently as possible the percentage of those cases supposably due to traumatism in which some hereditary or acquired conditions existed, and which would render an injury, however slight, effective in inducing the disease. Without entering into the old discussions of heredity or transmission of disease from generation to generation, I wish to affirm my belief in the theory that a disease or diathesis in the parent may be transmitted to the child, if not through the same tissue and by the same manifestations, at least through different tissues, preserving the factors, chronicity and pertinacity. Let me illustrate. Much has been said about spinal caries being essentially a tubercular disease, and men whose experience and judgment must be profoundly respected hold now tenaciously to this theory. They find often a tubercular family history, probably running through two or three generations; and where they do not find this history, they conclude that such a diathesis must exist and has escaped their search. The opponents of this theory claim that no tubercular deposit has been found in the vertebrae thus carious, and, furthermore, in many instances no tubercular deposits can be found in the lungs or other organs, and on these negative facts they stoutly deny any tubercular element in the etiology. Now, it seems to me that no question in general pathology rests on a firmer basis than this: that a tubercular diathesis, or any diathesis, in the parent may be and is transmitted to the child, and manifests itself not in the organs through which the diathesis manifests itself in the parent, but through other organs and tissues. The type of the lesion may change in many particulars. The diathesis may be masked, and good hygiene and a prophylactic course of treatment may prevent its development in any tangible form, yet there remains the vulnerability. Those who have had occasion to study the alcoholic diathesis find transmitted lesions in the nervous system. How frequently are we baffled in our efforts to relieve a seemingly trifling disease in a child, and how zealously do we resort to drug after drug, when,

finally, our attention is called to a suspicion of a syphilitic diathesis in the parents, we begin our anti-syphilitic medication, and a cure speedily follows! In one of the cases included in my analysis this fact is strikingly illustrated:

A little girl, aged seven years, was brought to the outdoor department for a synovitis of the right knee. There were found the usual symptoms and signs accompanying a sub-acute arthritis, and, furthermore, the child seemed in an excellent condition of health. The mother had traced the disease to a fall some three months prior to her first visit to the Hospital, which was during the early part of 1876. The appearance of the mother, it is true, aroused my suspicion as to the existence of syphilis in herself, yet I could at that time see no connection between her disease and the one for which she brought the child. In fact, I did not pursue an investigation even, but proceeded to treat the child after the usual manner. I made slow progress, and after a few months the mother grew naturally dissatisfied and discontinued her visits. During the early part of 1877 she returned, after having visited in turn other dispensaries. I found the child still lame, and the knee in about the same condition as when I last saw the case. I instituted the same treatment, and proceeded to keep full notes of the progress of the case. After two months' observation I found no improvement. I then obtained an accurate history of the family, and I found that this child had been born subsequent to the development of syphilis in both father and mother, and I obtained a history of hereditary syphilitic manifestations in the earlier years of the child's life. I discarded all former treatment, and ordered potassium iodide, in ten-grain doses, thrice daily. Within ten days the improvement was most decided. In less than a month a perfect cure was accomplished, and up to the present time no relapse has occurred.

Under hereditary diathesis I have included the following: Consumption, rheumatism, syphilis, insanity, and epilepsy, strumous diseases as shown in the lymphatics, or bones and joints.

Where it was possible, I have noted the occurrence of any of these diseases in any of the members of the father's family,

of the mother's family, and where they occur on both sides of the house. Still further, I have examined closely in a certain proportion of the family histories of my cases, i. e., I have ascertained the existence or non-existence of any of the recognized strumous diseases in other members of the family. For instance, if I have found, in tracing out a full history of a case, that several children have been still-born without any known pelvic or uterine cause in the mother, that one or two have died of "water on the brain," that several have died of cholera infantum, or that one or two have chronic bone or joint disease, I have observed the fact under the column headed "family." This has seemed to me circumstantial evidence that some hereditary taint has been transmitted either directly or by atavism, direct evidence of which taint I have failed to get in obtaining my history. I have this observation to make while speaking of histories: At a dispensary the father scarcely ever appears. The child is usually brought by the mother, and from her alone, stupid as she sometimes is, the family history on both sides of the house must be obtained. This fact makes it necessary to admit circumstantial evidence in scientific investigations.

The percentage of cases where paternal heredity was possible, where maternal heredity was possible, and where both were possible, I have thought best to give, although seemingly unimportant, separately. I have done this more with a view of studying the natural histories of the cases respectively at some future time, especially as many are still under observation. The point, then, to be brief, is this: Does a case of hip-disease, for instance, where there is a tuberculous paternal family history, act differently from one where there is a tuberculous maternal family history, other conditions, of course, being equal? To pursue the investigation still further: Does a case of hip-disease with tubercular diathesis in both father and mother prove any more serious and rebellious to treatment than one with the tubercular element confined to only one parent?

In the columns devoted to the acquired diathesis I have included such cases only whose inception was observed in the wake of some one of the exanthemata or exhausting diseases

of childhood: rachitis and the attending deviations from a normal nutrition; a severe dentition; exhaustion and malnutrition attendant upon strumous, skin, eye, and lymphatic diseases; a prolonged cholera infantum, from whatever cause produced; pertussis, severe in character and disappearing after a long convalescence; rubeola, and scarlatina, and varicella, and vaccinia, and variola, with their respective sequences and consequent debilitating influences; bad hygiene, etc., etc. —all these I have taken into account in searching for an acquired diathesis or cachexia. When I have been able to trace a causative relationship between any of these influences and the joint-disease, I have so noted in my tables. Of course, a certain proportion of joint-diseases occurred prior to the development of any of these diseases which affected seriously the nutrition of the patient and were necessarily aggravated by such an intercurrent. Still, I have not included these in my table, but shall probably be able to state in numbers in what proportion of instances such observation was made. A certain number were not observed with reference to this point, and the percentage has not been given. Where both hereditary influences and an acquired diathesis existed in combination, note has been made and the percentage given.

To make the analysis more complete, it was my purpose to give the wards of the city, and hygienic surroundings, social and otherwise; but I was met by the following difficulties: The poor of New York are constantly shifting from place to place. At one time good quarters are at their command, and at another time the vilest hovels serve as habitations. The point of value would be to find the kind of house and the locality at the time the disease was developed, and not where the patients lived when application was made for treatment. In all histories and records this fact is alone obtained. Without any authentic statistics, then, I will venture to assert that fully seventy-five per cent. of the cases included in my analysis occurred in the children of the poor; that they were under poor hygienic influences when the disease was developed, and that their vitality, as a consequence, was far below the normal standard.

With reference to the relative frequency of the regions

involved in the carious process, I found that in four instances the cervical vertebræ were alone affected, in one hundred and forty-eight the dorsal vertebræ alone, and in thirty-seven the lumbar.

The disease involved the cervico-dorsal region in thirty-seven instances, and the dorso-lumbar in seventy-two instances. Two cases of dorsal caries were complicated with synovitis of the left elbow, two with synovitis of the right knee, and two with synovitis of the left ankle. One case of lumbar caries was complicated with disease of the left ankle. In one case caries of the cervico-dorsal and of the dorso-lumbar vertebræ had the additional lesion of synovitis of the left knee.

To revert to Table IV., it will be observed that thirty-three cases traumatic were not investigated with reference to any hereditary influences. This number I have consequently deducted from the one hundred and ten supposed to have traumatism as the exciting cause. I then have seventy-seven, and of this number I found that twenty-three gave, on my first impression, evidence of being free from any hereditary complications, i. e., I found that an attempt had been made by those who recorded the notes to ascertain the existence of any hereditary diseases in the history of either parent, and had failed to find any such disease or diathesis.

The twenty-three seemed to me worthy of especial investigation, and accordingly I have endeavored to study them closely, and am prepared to speak with a certain degree of scientific exactness.

My object is to ascertain the exact number of cases of undoubted Pott's disease of which I can predicate no hereditary predisposition, and no diathesis or cachexia induced by any of those diseases of childhood which authors recognize as sometimes causing struma.

Of the twenty-three cases traumatic, then, I have to state that in five a poor hygiene existed prior to and at the time of the development of the spinal caries. Two or three of these five cases gave a history of doubtful traumatism, so that I feel justified in excluding the number influenced by a wretched hygiene. In eight instances an exciting cause was found in some one of the exanthemata or cachexiæ induced by disease.

Eight were totally unreliable, and hence excluded. Two remain, and I must say that I do not feel satisfied about either being absolutely clear as to record. From one the history was obtained, and he did not know of any diseases on either side of the house. The full text of this case I shall give, however, in the general summary. The second is reported on the case-book as having been always healthy prior to the injury from which his disease developed, and as being free from any hereditary taint on father's or mother's side. The history was taken by myself in the early part of my professional career, and at that time I sought only for consumption in the family. Had I the opportunity of taking the same history to-day, I am sure that I should investigate more points, and obtain both positive and negative bearing on the subject under consideration. This case I shall also give in another connection.

Among the one hundred and sixty-nine cases non-traumatic, sixty-three were not investigated with reference to heredity, and hence I took one hundred and six for analysis. Of this number twenty-one were partially negative and incomplete, seemingly free from any influence of hereditary diathesis. On closer analysis, however, in nine of these a cause was found in an acquired diathesis, i. e., the diathesis was induced by diseases of infancy. In eight the histories, from their brevity and omission of important points, were totally unreliable. In three a wretched hygiene, in the fullest sense of the term, was found. One is left, then, with fair evidence of a clear record; yet I doubt whether this case even would satisfy the believers in a strictly strumous origin for joint-diseases. Further on I shall give a full history, and leave my readers to judge for themselves.

Should any one attempt a summing up of the columns in my tables, a tally will not be found, by reason of the manner of construction. This is briefly as follows: I found first the number of cases where the father's family alone gave some one of the transmissible or hereditary diseases; the same in the mother's family; the number where both families were represented; the number of cases in which evidence of an overlooked hereditary diathesis was found in other children

of the family, i. e., where hydrocephalus, a number of stillbirths, etc., had occurred ; the number where both family and either father or mother gave evidence of hereditary disease. These numbers, added together, gave the number analyzed. Then I added the number found in the column "both parents" to that in "father" and in "mother." Furthermore, to these same were added the respective numbers of instances, as found in the column "both parents and children." To the original number, as found in the column "other children in family," was added the number found in the column immediately following. The percentages were then taken and tabulated.

Of the hereditary diseases embraced in the table, I have to observe that, in the paternal family, consumption was found in twenty-seven instances, in the maternal thirty-six ; rheumatism—i. e., recurring acute, or chronic rheumatism—was found in paternal family twelve times, maternal fourteen ; scrofulous diseases of unquestioned type, in paternal five times, maternal eleven ; syphilis contracted prior to the conception of the offspring, in father five times, in mother once ; habitual drunkenness, or alcoholism, preferably still, the alcoholic diathesis, in father seven times, in mother three times ; insanity, in father twice, in mother once.

My own interest has often been directed to the influence the exanthemata have in the development of joint-diseases, and I have accordingly sought to ascertain the statistics. Of the two hundred and nine cases of spinal caries investigated with reference to this point, I find that the disease was induced by pertussis in fifteen cases, five of these giving an hereditary diathesis, three giving none, and in seven the question of heredity was not investigated. This fact has been observed by other writers, and I am happy to add the evidence of statistics.

Rubeola was found as the exciting cause in eighteen cases, and of this number hereditary influences were found in eight, not found in nine, and not sought in one. Scarlatina induced the disease four times, and of this number hereditary disease was found once, not found once, and not sought twice. Rachitis was found as the cause in eight cases, of which heredity

was found in four, not found in two, and not sought in two. Cholera infantum was noted as the cause in five instances, all of which gave hereditary disease in the family. Vaccinia was noted as the exciting cause in three, and two of this number gave hereditary disease in the family, while in one it was not sought. Varicella, cerebro-spinal meningitis, pneumonia, intermittent fever, and rheumatism, were found as exciting cause in one instance respectively.

I now pass to the cases of hip-disease, and have tabulated two hundred and sixty-five analyzed with reference to heredity, and two hundred and seventy-one with reference to an acquired diathesis.

TABLE V.—Giving 265 Cases of Hip-Disease analyzed with Reference to Hereditary, and 271 with Reference to an Acquired Diathesis.

| | Traumatic. | Non-traumatic. | Total. |
|--|------------------|------------------|------------------|
| Number analyzed. | 130 | 142 | 272 |
| Percentage of cases where heredity was found. | 64 $\frac{3}{4}$ | 58 $\frac{1}{2}$ | 60 $\frac{1}{4}$ |
| Percentage of hereditary diseases as found in father. | 30 $\frac{3}{4}$ | 28 $\frac{3}{8}$ | 30 $\frac{1}{4}$ |
| Percentage of hereditary diseases as found in mother. | 31 $\frac{1}{2}$ | 26 $\frac{3}{4}$ | 29 |
| Percentage of hereditary diseases as found in both parents. | 9 $\frac{1}{4}$ | 4 $\frac{1}{2}$ | 6 $\frac{3}{4}$ |
| Percentage of hereditary diseases as found in other children in family. | 29 $\frac{3}{4}$ | 21 $\frac{3}{4}$ | 25 $\frac{3}{4}$ |
| Percentage of hereditary diseases as found in both parents and children. | 15 $\frac{1}{2}$ | 14 | 15 |
| Number analyzed. | 122 | 149 | 271 |
| Percentage of cases where cause was found in acquired diathesis. | 9 $\frac{3}{4}$ | 26 $\frac{1}{4}$ | 18 $\frac{3}{4}$ |
| Percentage of cases where hereditary and acquired diathesis was found. | 4 $\frac{3}{4}$ | 14 | 10 |

This table is constructed in the same manner as Table IV., and my remarks shall be directed chiefly to those cases in which an apparent effort was made by the historian to trace any hereditary diathesis, and negative results were recorded. The same remarks concerning the mode of taking the histories, and the parent from whom such history was obtained, as were

made under the heading of "spinal diseases," are applicable in this connection.

The whole number, then, of cases traumatic and non-traumatic which I have thus subjected to a more rigid analysis—such an analysis as science demands—is one hundred and six. I find the history totally unreliable in sixty-five instances, an exciting cause among the exanthemata in fifteen, a bad hygiene in connection with an unreliable history in twelve, a wretched hygiene in two, and in nine there is no evidence of an acquired diathesis having been sought by the historian.

(*To be concluded.*)

ART. II.—*Cardiographic and Sphygmographic Studies.* By
A. T. KEYT, M. D., Cincinnati, Ohio.

THE present paper is founded upon original observations and experiments, and is offered in the hope that it will prove a contribution to a better knowledge of the characters, relations, and significations of the normal cardiographic and sphygmographic traces.

My qualification for accurate work in this line of inquiry arises mainly from my experience in the use of certain instrumental devices and combinations, invented by myself, and peculiarly adapted to the purpose intended. In addition, I claim for myself a keen interest in the work, and the exercise of scrupulous care at every step of its execution. I shall introduce in the paper only so much description of instruments and methods as may serve to illustrate the process and exemplify the fidelity of the results.

Much use of the instrument described in the January number, 1876, of the *New York Medical Journal*, together with new experimentation, has shown me wherein changes in the mechanical details would be improvements. Accordingly, while retaining strictly the principle, I have devised certain modifications in the construction; and the instrument, as I now use and recommend it, and as forming the basis of a special combination, presently to be described, is represented in Fig. 1.

The more prominent changes consist in reducing the length

of the instrument to that of about nine inches, placing the clock-work near the outer end of the index-branch, the latter terminating in a cross tube, the long limb of which is connected with the graduated tube, the short limb with the reservoir; a simpler and neater device, by means of which the index-tube may be placed erect or recumbent at will; a superior contrivance for fixing the small membrane, and regulating its tension; a system of nicely-working screw adjustments for the writing-lever; removal

EXPLANATION OF FIG. 1.

A, the base; *B*, the rubber tube; *C*, the 3-way stop-cock; *D D*, the lateral tubes; *E*, the lateral cup; *F*, the cross-tube; *G*, the reservoir; *H*, the index-tube; *J*, the device for connecting the index with the cross-tube; *K*, the disk-head, screwed on over the lateral cup; *L*, the pin, with its head fixed in the centre of the disk, and its point lodged in the conical socket *M*; *N*, the tracing-lever, moving on the pinion *O*; *P*, *R*, screws for the horizontal and vertical adjustment of the lever; *S*, screw for the horizontal adjustment of the pin-socket—the lever supported as shown; *T*, the stage-movement, of which 1 is the winder, 2 the trigger, and 3 the speed-regulator; *U*, the stage or carriage; *V*, the smoked glass, on which is a tracing of the radial pulse, seen from behind, the lever also shown in outline below the tracing; *W* and *X*, the supporting columns; *Y*, the base-board.

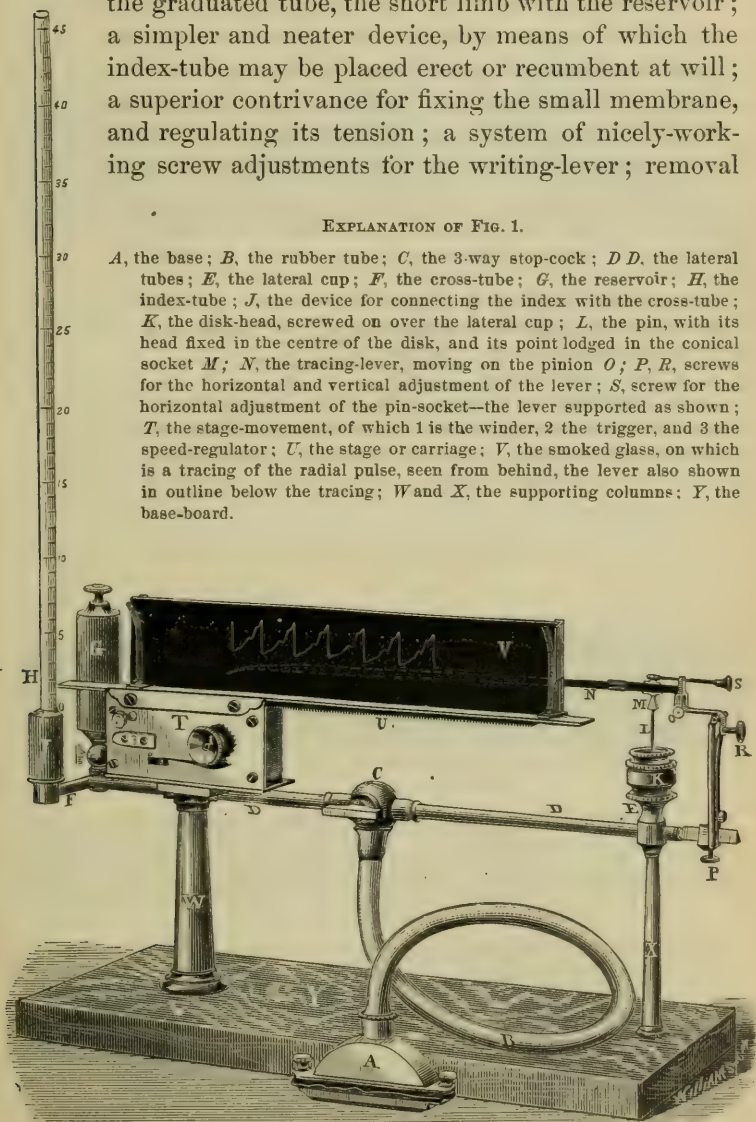
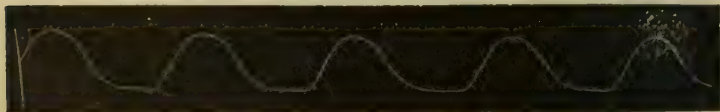


FIG. 1.—SPHYGMOGRAPH, OR CARDIOGRAPH.

of the base to a convenient distance from the stop-cock, by the interposition of a sufficient length of firm, small-bore rubber tubing; and the provision of a rest, on which the instrument is securely placed, while the base remains free for adaptation to any position or direction required. Other changes, more or less important in themselves, but not deemed necessary here to particularize, have also been made. The excellence of the modifications has been amply attested. This instrument, used to trace the pulsations of an artery, is a *sphygmograph*; used to trace the pulsations of the heart, a *cardiograph*.

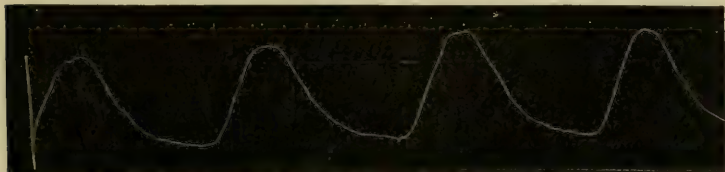
Observation 1.—Having removed a portion of the breast-bone of a living turtle, I placed the base of the cardiograph on the heart *in situ*, a finger touching the ventricle, to keep the organ in place under the instrument, and at the same time note the relationship of phenomena. Successively the heart felt as a hard ball and then as a flaccid sack. As the ventricle hardened, the spirit-index rose; as the ventricle softened, the spirit-index fell. The force turned upon the lever, it rose and fell, just as the liquid, with the hardening and softening of the ventricle. Tracing No. 1 was taken under these circumstances.



No. 1.—Tracing of a Turtle's Heart.

Observation 2.—Severing the heart from its connections, I placed it upon a table, with its anterior aspect uppermost. It passed through its evolutions apparently the same as previous to its removal. It suddenly became hard to the touch, coincidently increasing its transverse diameter, bulging its anterior wall, twisting to the left, and tipping the apex forward at the end of the movement. Instantly following this stage, the ventricle became suddenly soft to the touch, coincidently extending its longitudinal diameter, letting fall its apex, flattening its anterior wall, and during these changes twisting toward the right. The cardiograph applied to the

heart showed the upward sweep of the liquid column and writing-lever coincident with the first series, and the downward sweep of these indices coincident with the second series of phenomena described. No. 2 is the cardiogram traced under these circumstances.



No. 2.—Tracing of a Turtle's Heart after Removal from Body.

Observation 3.—In man, the following coincidences and sequences of phenomena are determined: Marked impulse, as if a hard ball were thrust from within against the chest-wall; elevation of the corresponding intercostal space or spaces; emission of the first sound of the heart; major rise of the spirit-index and writing-lever; these quickly succeeded by a lesser impulse; the second sound of the heart; depression of the intercostal space or spaces; and major fall of the spirit-index and writing-lever. No. 3 is the cardiogram of a healthy man.



No. 3.—Normal Human Cardiogram.



No. 4.—Cardiogram from Chest-Wall of a Toad.



No. 5.—Cardiogram from the Chest-Wall of a Six-weeks-old Kitten; Pulsations 380 per Minute, and modified, as seen, by the Respiration.

Deductions.—Observations first and second together furnish positive proof that, in the tracing of a turtle's heart, the

upward sweep is made by the systole, and the downward sweep by the diastole of the ventricle. And the three observations together afford conclusive evidence that, in the normal cardiographic trace of man, the main up-stroke and the main down-stroke are produced respectively by the systole and diastole of the ventricles.

I have been thus particular at this stage of the investigation, because of the evident fact that, until the relationship of the graphic lines to these two chief conditions of the heart's action is established, there can be no trustworthy inter-

EXPLANATION OF FIG. 2.

In this cut the repetitions of Fig. 1 are marked by the same letters; in addition, *CH* is the chronograph, of which *W* is the winder, *D'* the dial, *P'* the pendulum, and *L'* the tracer; *Z* is the double rest for the levers. On the glass, in direct view, are three tracings—one of the heart, one of an artery, and one of time in seconds and fifths.

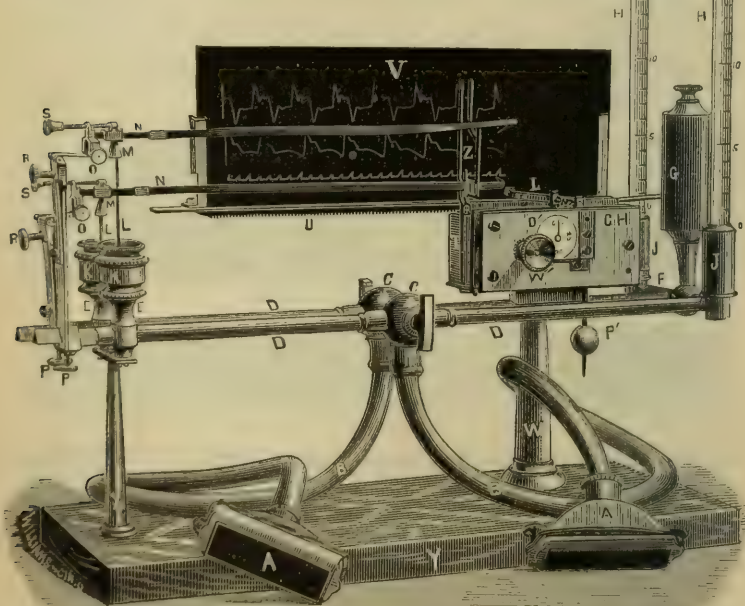


FIG. 2.—CHRONO-CARDIO-SPHYGMOGRAPH, OR DOUBLE SPHYGMOGRAPH WITH CHRONO-GRAPH.

pretation of the cardiac and arterial pulse-curves. Passing this question as settled, I proceed to extend my data.

Demonstrations of the Form, Relationship, and Chronometry, of the Cardiac and Arterial Movements.—In the prosecution of these inquiries I have been enabled to gain superior advantages and results by the use of the apparatus represented in Fig. 2.

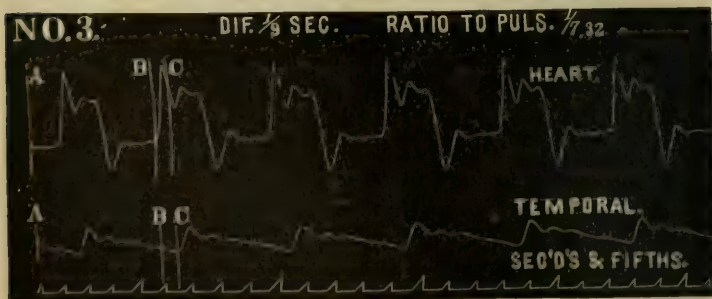
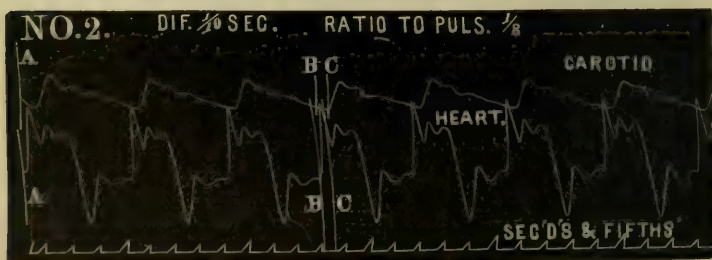
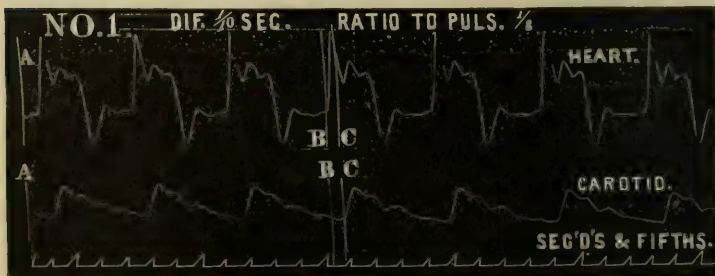
It consists essentially of two sphygmographs placed side by side, provided with one stage-movement for both instruments, and an *inscribing chronometer*, all arranged so that the three levers impinge at different heights upon the same slide. The time-writer, or *chronograph*, as I name it, is a neat and correct instrument (constructed for me by a skilled watchmaker), regulated by pendulum and escapement, and marks seconds and fifths with perfect accuracy.¹

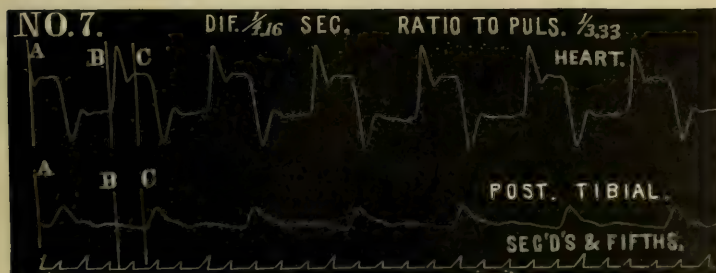
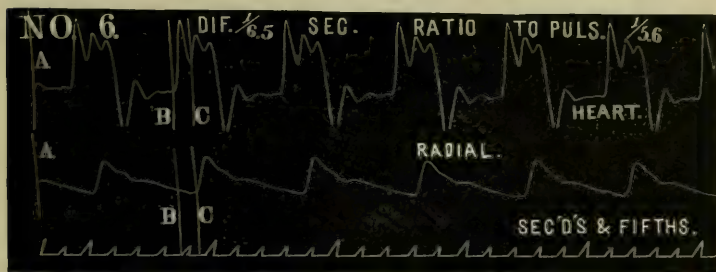
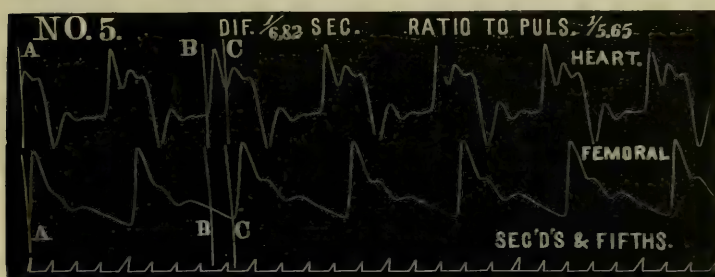
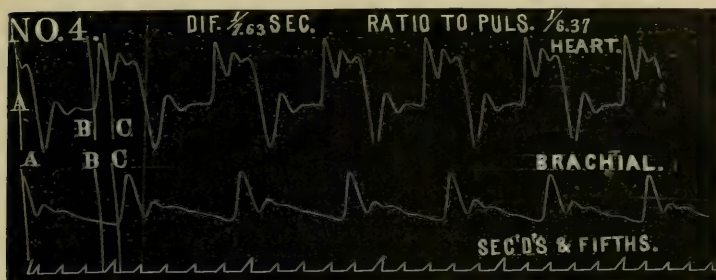
To Use the Apparatus.—Having started the time-movement, place one base upon the heart, the other upon the artery selected, or each on a different artery, according to the purpose in view. When the corresponding levers are executing their best movements, start the clock-work that moves the carriage bearing the smoked glass. The result will be three graphic lines: one a cardiogram, one a sphygmogram—or two sphygmograms, as the case may be—and one a *chronogram*. Tracings so taken with skill and care may be accepted as true and exact representations of the form, duration, and succession of the events under consideration.

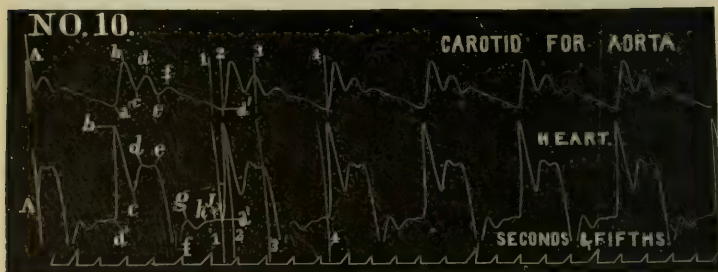
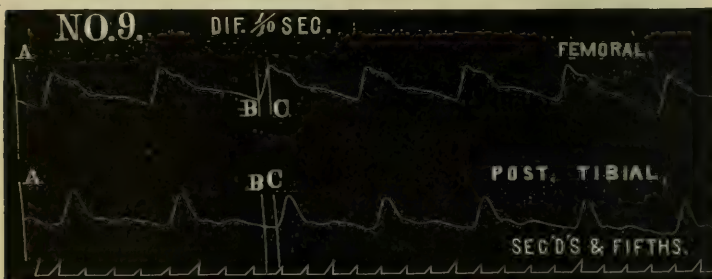
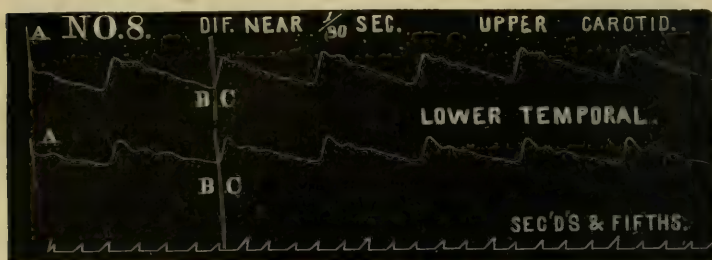
I now call attention to the following work accomplished by means of the apparatus described. A medical friend, aged thirty-two years, in good health, kindly submitted himself for experimentation, and aided me with his intelligent and skillful assistance. When the cardiac and arterial tracings were being taken together, the subject occupied the left prono-lateral position, and held the cardiac base in place himself, while I held

¹ Although this mechanism was originally devised to form a part of the apparatus under notice, and for the aid it promised in special lines of investigation, yet so convenient and satisfactory and useful does it prove, when used in connection with the simple sphygmograph and for ordinary work, that the writer has come to esteem it as almost an indispensable addition to this instrument.

the arterial base and manipulated the apparatus. So, when the pairs of arterial tracings were being taken, he held one base *in situ*, while I held the other and managed the rest. The stage-movement was set at a rather greater speed than usual, in order to show better the curves and distances. The adjustments were all in order, and every care was observed to insure truthful results.







The tracings as produced were marked with the name of the artery, or arteries, and then fixed by the accustomed method. In due time they were prepared for the engraver by adding the lines and inscriptions which appear in the reproduction, and are as follows: *A*, of each tracing, is the curved line already on the glass, made by the lever before the start of the carriage, and from some point in which line the tracings begin. The lines *B* and *C* were drawn with a compass whose span equalled the length of the levers; the glass and fixed point of the compass being in the same relative position as the glass and pinions of the levers respectively, so that the lines

described by the free point of the compass would be parallel throughout with lines described by the levers on the glass at rest. In this manner *B* was drawn through the point of ascent of the cardiac trace, and *C* through the point of ascent of the arterial trace. Or, where two arteries were under experiment, *B* was drawn through the point of ascent of the proximal, and *C* through that of the distal. The curve *B*, on the pulse-line, was drawn at the same distance from *A* of this line as that between *A* and *B* of the heart-line; and the curve *C* on the heart-line was drawn at the same distance from *A* of this line as that between *A* and *C* of the pulse-line. The same rule was observed in drawing the curves for the pairs of arterial traces. The distance *B C* measures in horizontal line the difference between the points of ascent of the cardiac and arterial traces represented. The time-value of *B C* is ascertained by its measurement on the proper part of the chronogram, and to indicate which the lines *A B* from the lower tracing were carried down. The other markings need no special designation here, but will be referred to in the proper place. The engravings are faithful reproductions, and the work is before us for our study.

It is evident that the series represents the form, relation, duration, and succession of the movements pertaining to the same pulsations, as they emanate from the heart and display themselves in different arteries. Both in cardiac and arterial traces the space between the successive basal points of the main ascending lines measures an entire round of pulsation, and, in the corresponding pulsations of the respective pairs, these distances are found to be equal. The distance *B C* running through the series, and seen of different lengths, represents, as before remarked, the *asynchronism* between the beginning of these corresponding pulsations.

I will now trace these chronometric differences, obtained by the means and in the manner above described :

No. 1 presents a tracing of the heart, the carotid artery, and the divisions of time. *A B* shows the distance to the commencing cardiac pulsation, and *A C* the distance to the commencing carotid pulsation; while *B C* shows the difference between these beginnings. *B C*, taken accurately be-

tween the points of hair dividers, and then placed on a hundredth-inch scale, under a magnifying glass, was found to span $6\frac{3}{4}$ of the divisions, while the fifth of the second, of which $A B$ is a part, was found to span $13\frac{1}{2}$ of the divisions. So the formula stands: $A B = \frac{6\frac{3}{4}}{13\frac{1}{2}}$ of $\frac{1}{5} = \frac{1}{10}$ second. Ratio to pulsation, $\frac{1}{8}$.

No. 2 is a repetition of No. 1, the tracings taken with the bases reversed to show that the difference obtained was not produced in the instrument, but by the action of the organs on which it was placed. The difference worked out as in the preceding gives the formula: $B C = \frac{6\frac{3}{4}}{13\frac{1}{2}}$ of $\frac{1}{5} = \frac{1}{10}$ second.

No. 3 contains a tracing of the heart, and temporal artery in front of the ear, with accompanying chronogram. The difference is expressed by: $B C = \frac{8}{14\frac{1}{2}}$ of $\frac{1}{5} = \frac{1}{9\frac{1}{6}}$ second. Ratio to pulsation, $\frac{1}{7\frac{1}{32}}$.

No. 4 shows the pulsations of the heart and brachial artery at the bend of the elbow, also the time. Difference expressed by: $B C = \frac{9\frac{1}{2}}{14\frac{1}{2}}$ of $\frac{1}{5} = \frac{1}{7\frac{1}{63}}$ second. Ratio to pulsation, $\frac{1}{6\frac{1}{37}}$.

No. 5 is a tracing of the heart, and femoral artery at the groin, and the time. Formula of difference expressed by: $B C = \frac{11}{15}$ of $\frac{1}{5} = \frac{1}{8\frac{1}{81}}$ second. Ratio to pulsation, $\frac{1}{5\frac{1}{65}}$.

No. 6 is of the heart and radial artery, with time-line. Formula of difference: $B C = \frac{10}{13}$ of $\frac{1}{5} = \frac{1}{6\frac{1}{3}}$ second. Ratio to pulsation, $\frac{1}{5\frac{1}{6}}$.

No. 7 shows the pulsations of the heart and posterior tibial behind the malleolus, with corresponding time. Formula of difference: $B C = \frac{5}{12\frac{1}{2}}$ of $\frac{1}{5} = \frac{1}{4\frac{1}{6}}$ second. Ratio to pulsation, $\frac{1}{3\frac{1}{33}}$.

No. 8 shows tracings of the carotid, and temporal in front of the ear, and the time. Formula of difference: $B C = \frac{5}{15}$ of $\frac{1}{5} = \frac{1}{9}$ second.

No. 9 shows tracings of the femoral at the groin, and posterior tibial behind the malleolus, with the time. Formula of difference: $B C = \frac{7}{14}$ of $\frac{1}{5} = \frac{1}{10}$ second.

The original glasses I do not hesitate to name as perfect delineations of these asynchronisms. The measurements were made from the glasses. For the figures given, I ask a limited margin, on account of the difficulty of defining precisely the point of ascent; this, especially in the arterial traces, being

more or less obscured in a curve. However, I believe the fractions given do not err in any instance to exceed the one-hundredth of a second. I have taken many tracings besides these now recorded, and calculated from them the differences, and, while the results vary somewhat under modifications of the circulation consistent with health, the average for a healthy man corresponds with the figures announced.

It will be noticed that the *fifths* of seconds vary in the measurement from twelve and a half to fifteen-hundredths of an inch. At first view this might be taken as showing irregularity in the time-measurement; but, in reality, it notes the unequal speed of the carriage. As more or less inequality pertains to the run of the best-constructed stage movements, the necessity of the chronograph becomes apparent.

What part of the difference belongs to the systole of the ventricle previous to the rise of the pulse? This can be determined with sufficient accuracy. By reference to No. 8, also by calculations based on Nos. 1 and 3, it will be seen that the ventricular impulse traverses the space between the carotid artery and temporal in front of the ear in about one-ninetieth of a second. The distance between these points may be approximately estimated as two-thirds the distance between the commencement of the aorta and carotid at the point of observation. Hence the ventricular impulse would travel to the carotid point in about the sixtieth of a second. The sixtieth of a second subtracted from a tenth, the time-difference between the cardiac and carotid pulsations, gives the twelfth of a second as the period during which the ventricle is contracting before the aorta begins to fill.

In accordance with this estimate, I constructed a plate representing the heart and commencing aorta in juxtaposition, after the following method: Taking a glass on which were traced the heart and carotid, with the heart beneath, and accompanying chronogram, I drew an artificial starting-curve A, parallel with, and the sixtieth of a second within, the true one of the pulse-line. Measurement from this line made the difference between the heart and artery one-twelfth second, the estimated asynchronism between the heart and aorta. Next, I divided the glass longitudinally, and slid the pieces

along until the tracings were more nearly in perpendicular line with each other, and then, fixing them in this position, I marked the plate for purposes of illustration. No. 10 is the representation.

Returning to the curves and their interpretation, attention is directed first to the cardiogram on No. 10. The letters and numbered curved lines indicate the points and distances to be noticed. We have already seen that the line of a cardiac pulsation ascends during systole and descends during diastole. The next question for settlement is, Where does systole end and diastole begin?

It is evident that so marked a change as is implied in the sudden transition from one to the other of these opposite conditions of the acting heart must conspicuously reflect itself in the cardiographic line. The prominent points after the beginning are the first elevation *b*, the depressed point *c*, the second elevation *e* (*d* and *e* being often merged into each other), and the lowest point *f*. The point *b* would give no time for the discharge of the ventricle, the point *c* would give inadequate time, and make the systolic portion incongruously short; therefore *b* and *c* are excluded. Is *f* the point? The assumption is favored by the plausible explanation offered in its support, that both the main ascent and main descent are made successively by the contraction and depletion during contraction of the ventricle. Nevertheless, it is disproved, first by the fact that, in using the stethoscope while the cardiograph is in place, the second sound of the heart is located not at the bottom but a little below the top of the main downward sweep, both of the spirit-index and writing-lever; second, by the fact that the sphygmie portion of the horizontal distance between *a* and *f*, placed on the corresponding pulse-line, exceeds the portion of this line that can properly be assigned to cardiac systole; and third, by the record of the observations detailed in the first part of this paper. Thus we arrive by exclusion at *e*, as the point which represents the end of systole and beginning of diastole. By reference to the plate, 1 to 3 measures the systolic portion, and 3 to 4 the diastolic portion of the heart's revolution. The ratio of these divisions to each other is seven to nine; the systole occupying

seven-twentieths, the diastole nine-twentieths, and the round pulsations four-fifths of a second. Though anticipating, this seems a suitable place for stating the ratio of the corresponding portions of the arterial pulsation. 2 to 3, and 3 to 4, on the pulse-line represent these divisions. Their ratio is one to two; the first occupying four, and the second eight-fifteenths of a second.

Having fixed these landmarks, so to speak, I will now give what I conceive to be the true meaning of the cardiographic line, and afterward of the sphygmographic. I shall not delay to argue the points, but rest my proof upon the harmonious fitness of the interpretations I offer.

The ventricle contracts, which sends the lever rapidly upward to the highest point *b*, from which it suddenly falls in consequence of free discharge into the aorta. Under the repletion, tension is soon established in the artery, and further flow from the heart is resisted, which checks the downward course, and forms the point *c*. Following very close, the first shock of resistance reflected back upon the heart is expressed by the wave *d*, while the completed contraction under the resistance forms the line *c d e*. (*d* is often not discernible as a separate wave.) The marked and sudden change from contraction to complete relaxation of the ventricle lets fall the lever, which, in descending, describes the long line *e f*. By the time *f* is reached the ventricle is refilling by influx of blood from the auricle, and this raises the line to *g*. At this stage, the ventricle and auricle, with walls quiescent, and cavities partly filled and in open communication, first the auricle sharply contracts, swiftly transmitting its *shock*-impulse, which raises the wavelet *h*, and this immediately followed by its *discharge*-impulse, which raises the wavelet *j*; next the ventricle contracts. Cardiograms that delineate the small curves, represented by *h* and *j*, are among the niceties of cardiography. Usually these are merged into one, and not unfrequently only the curve represented by *g* is shown. I believe the three belong to perfect cardiograms, and that they express the events as described.

One naturally inquires for the mark of closure of the auriculo-ventricular and semilunar valves. These events are

not plainly shown, for the reason that they are involved in the greater events of systole and diastole, and transpire, the one while the lever is rapidly ascending, the other while it is rapidly descending, thus contravening a more distinct record of their occurrence. However, the auriculo-ventricular closure may be discerned sometimes in a slight change of direction near the top of the up-stroke; and the ventriculo-arterial closure may be discerned more often, perhaps, in a change of direction a little below the turn into the down-stroke.

It is of interest to notice that the indications of the cardiometer agree with the lines made by the cardiograph. The spirit-index first rises quickly and smoothly to its highest mark, and then, without noticeable pause, quickly descends. The descent is soon arrested, a quiver, or second rise, is seen, and then the liquid descends rapidly to a point below that from which it first rose. From this lowest point it springs to near the level of the beginning, then displays a series of quivers, and then shoots up again, and so on in succession.

The points for consideration in a normal human *sphygmogram* are the main rise $a b$, the first fall $b c$, the line $c d$, here shown rising, but subject to variety of direction, the second fall $d e$, the rise $e f$, followed by a depression, and thence a gradual decline, marked by a succession of small waves, to the starting-point a .

The moment that the tension of the ventricle under contraction upon its contents reaches the highest mark—represented by the point b —in the cardiogram, the aortic valves open, and the blood rushes in and distends the artery. This movement rapidly diminishes ventricular tension, and raises, in the mean time, arterial tension to the point of its climax. Thus is formed $a b$ of the pulse-trace. The climax of arterial tension is reflected back upon the heart, and at the same time is rapidly receded from by the quick onward passage of the blood. The heart responds to the stimulus of resistance by a renewed final throe, which rapidly discharges the remaining contents, and serves to stay the arterial recession. Thus is formed $b c d$. At the end of the final throe the ventricle instantly relaxes, removing at least all pressure on the arterial column from behind; coincidently the blood is freely

escaping toward the capillaries. The effect of these factors is a decided fall of the artery, and formation of line *d e*. The fall is checked at *e*, and the line sent up again to *f*, by the closure of the semilunar valves and rebound of the blood therefrom. In regard to the succeeding small curves, I conceive that in perfect sphygmograms three are indicated, and that the mechanism of their production is: the first, by the shock of auricular contraction; the second, by the quickly succeeding impulse of auricular discharge; and the third, by the first shock of ventricular contraction—these impulses transmitted to the closed aorta, and propagated thence to the other arteries.

Here, too, it is interesting to note the correspondence between the sphygmometric and sphygmographic indications. The liquid in the tube sweeps up quick and smooth to its highest elevation, and then less rapidly descends, marked in its downward course by a series of oscillations. The oscillations are a prominent one near the middle of the decline, and this preceded by one and succeeded by others, the same being slight quivers only disclosed to close observation.

As to the relationship of the sounds of the heart: When the carotid artery is under observation, the first sound is noted closely preceding the main ascent, and the second sound closely preceding the major oscillation of the descent.

In agreement with the foregoing interpretation, I would formulate the lines of a normal human cardiogram as:

1. The wave of first impulse (systolic).
2. The double wave of resistance (systolic).
3. The line of recession (diastolic).
4. The wave of influx into ventricle.
5. The wave of auricular contraction.
6. The wave of auricular discharge.

And the lines of a normal human sphygmogram I would formulate as:

1. The wave of first impletion.
2. The wave of second impletion.
3. The line of recession.
4. The wave of rebound from aortic valves.
5. The wave of auricular contraction.

6. The wave of auricular discharge.

7. The wave of commencing ventricular contraction.

Thus the lines of cardiac movement are for the most part represented in the lines of arterial; the correspondence, however, is not complete. The double cardiac wave of resistance is reflected single in the arteries. The cardiac wave of influx, if reflected through the just-closed aortic valves, is swallowed up in the arterial wave of rebound. The seventh arterial event has been sufficiently designated as the reflection of the first part of the cardiac wave of first impulse. The other correspondences are clearly defined and easily traced.

In further illustration of this special subject, I append, in conclusion, my observations of the play of the spirit-indices, when the respective bases are in place on different organs at the same time. When the heart and an artery, even the carotid, are under experimentation, at casual view the liquid columns seem to move in perfect alternation—the cardiac ascending while the arterial is descending, and *vice versa*. But closer examination reveals the fact that the relation is one of succession, and not of complete alternation. The main upward sweep of these quickly-moving columns can, with care, be well compared with each other; but after that, one fails to distinguish clearly the relationship of the oscillations peculiar to each decline. However, the successions are distinctly and beautifully shown, and, so far as the eye can discern, the relation throughout between the evanescent cardiometric and sphygmometric lines corresponds with the relation between the permanent cardiographic and sphygmographic lines.

I hope to continue these studies, and in my next communication to present the modifications of the heart and pulse lines under varying conditions of health and disease.

ART. III.—*Lead-Poisoning in Frogs.*¹ By JOHN J. MASON, M. D., New York.

THE influence which the absorption of lead exerts upon the system of a cold-blooded animal seems to have been com-

¹ Read before the American Neurological Association, June, 1877.

monly regarded as requiring no investigation, for I have been unable to find so much as an allusion to the subject in any of the general treatises on poisons, or in any of the numerous monographs on lead-poisoning.

This appears all the more remarkable when one considers the important services which experiments upon the frog have rendered, in discovering the mode of action of other toxic substances.

Hermann, in his "Treatise on Experimental Toxicology" (Berlin, 1874), when writing (page 24) on the choice of animals for experimentation, and naming, in order, man, warm-blooded, cold-blooded, and invertebrate animals, says:

"Among these, cold-blooded animals occupy the highest rank by reason of their availableness. The same qualities which have made the frog, after a well-known expression, the martyr of physiology, make him also the martyr of toxicology. . . . While, in warm-blooded animals, all poisons which by paralyzing the heart interrupt the circulation, or which by interference with respiration alter the proportions of gases in the blood, cause intense functional disturbance in all other organs, in the frog, the toxic effects above named have no influence on the condition of other organs, like the nervous and muscular apparatus, for example. Disturbance in the muscular and nervous systems, observed in the frog after poisoning, is surely to be ascribed to the direct effect of the poison upon these organs, and not to an indirect effect through a simultaneous disturbance of the heart, the breathing-apparatus, etc. . . . Recent toxicology has therefore been perfectly right in directing its attention to the frog."

The following experiments are a few selected from a large number which I have made during the past year. The animals were carefully examined every day, and the results, as noted, are now presented to the Association, in the hope that the subject may prove a suggestive and attractive one to other observers.

I. ACUTE POISONING.—Orfila (*Éléments de Toxicologie*, 1843, tome i., p. 633), Dr. Gaspard (*Journal de Physiologie Experimentale*, 1821, tome i., p. 284), and, more recently, Dr. René Moreau (*Recherches Cliniques et Experimentales sur l'Empoisonnement aigu par le Plomb et ses Composés*, 1875), have given us the results of intra-venous injections of the salts of lead in dogs. Little effect was produced by the subcutaneous method of injection, and this failure is ascribed by Mo-

reau to the slowness of absorption caused by the astringent action of the lead salts.

EXPERIMENT 1. *March 9, 1876, 3 P. M.*—I inject $1\frac{1}{2}$ grain of the acetate of lead under the skin (dorsal region) of a large frog (*Rana Temp.*). *6 P. M.*—The animal remains motionless when touched. When turned upon its back it regains the normal position without difficulty. *8 P. M.*—Voluntary or reflex movements can no longer be excited.

March 10th, 10 A. M.—Heart exposed, and found to be motionless, much enlarged, and filled with blood. Cardiac movements cannot be excited by pricking or by electricity. Muscles of the trunk and extremities, with their nerves, respond normally to electric irritation. This may be taken as a good example of acute poisoning by this salt.

The action of the poison in thus sparing the motor nerves of the extremities, and in being limited to the organs of respiration and circulation, will be found to correspond quite closely with the results obtained by Rouget¹ and those by Sklärek,² the former experimenting with the nitrate of silver, and the latter with arsenic, both employing the frog.

This experiment I have often repeated, and, although from twelve to twenty-four hours are required for the action of the poison to manifest itself, its effects are constant in this species (*Rana Temp.*).

II. CHRONIC POISONING.³—The more gradual absorption of lead through that here important organ of respiration, the skin, is followed by symptoms which differ widely from those noted above. In 1871, E. Heubel⁴ gave, at short intervals, small doses of the acetate of lead to eight dogs, during periods varying from two to eight weeks. Wasting and paresis of the muscles of the posterior and anterior thoracic regions and of the posterior extremities resulted, but no typical lead pa-

¹ "Arch. de Physiologie," 1873, p. 336.

² "Arch. für Anat. u. Phys.," 1866, p. 481.

³ I use the word "chronic" on account of the longer time which elapses before the poison affects the system, and of the constancy of the paralytic symptoms.

⁴ "Pathogenese und Symptome der chronischen Bleivergiftung. Experimentelle Untersuchungen."

ralysis was observed, nor were the electrical reactions given. The above are the latest, and, as far as I can ascertain, the only published experiments, made with the object of causing the symptoms of chronic lead-intoxication in animals.

EXPERIMENT 2. *March 22, 1876.*—Four small frogs (*Rana Temp.*) are placed in a glass globe containing: water, 24 fl. oz.; acetate of lead, 1 gr.

25th.—No change observable.

28th.—Frogs lively. Solution made stronger by addition of seven grains of the lead salt.

29th.—No effect observable.

April 3d.—One frog motionless. Posterior extremities paralyzed. Anterior extremities respond to the will. All the muscles of the posterior limbs respond far better to the action of the voltaic than to that of the faradaic current. Division of the spinal cord causes no movement in the lower limbs. Direct irritation of the sciatic nerves by electricity gives rise to no muscular contraction except in the peroneal muscle of one leg, causing slight flexion of the foot. Heart normal in size and action. The faradaic current used in these tests was from the second spiral of Du Bois-Reymond's apparatus. The voltaic current was supplied by small cells containing zinc and copper in pure water.

5th.—Two more frogs motionless. Motor nerves of lower limbs have completely lost their irritability. Muscles respond but little to direct faradization, while the voltaic current made to act on the same parts causes well-marked contractions and movements of the limbs. The hearts of both are normal, and beating rhythmically.

EXPERIMENT 3. *April 5th.*—The remaining specimen, with three others of the same species, are placed in: water, 24 fl. oz.; acetate of lead, 8 grains.

6th.—Frog from experiment 2 motionless. Reaction in nerves and muscles to electrical tests is found to be the same as that observed in the foregoing cases.

7th.—Desquamation is very active. This is a constant result, and due to the action of the solution. Microscopic examination of the cast-off membranes shows them to consist solely of a pavement epithelial layer.

10th.—Since the 7th there has been little to observe. To-day all three animals are motionless. Condition of nerves and muscles, and their electrical reactions, are found to be the same as in the previous cases. Hearts of normal size, and beating.

I have frequently noticed that some of the frogs always croaked as if in pain whenever the spine was pressed gently between the thumb and forefinger. The cries were provoked with much the same regularity as those caused by stroking the back after Goltz's experiment of separating the cerebrum from the parts below.

EXPERIMENT 4. *April 25th.*—A large bull-frog (*Rana Pipiens*) is placed in a solution: water, 48 fl. oz.; acetate of lead, 16 grains.

26th.—From being very inert, the animal shows signs of hyperæsthesia. Springs violently when touched lightly with the finger.

May 1st.—Since the 26th, moderate pressure on one side of the abdomen with the smooth end of a glass rod has caused violent jumping and loud croaking.

2d.—No signs of hyperæsthesia. When placed on the back, regains the normal position, but quite slowly.

9th.—Quantity of lead increased to 48 grains.

12th.—Frog is motionless. It cannot turn over when placed on the back. Electrical reaction of the sciatic nerves is completely lost. That of the muscles is the same as in the preceding experiments, viz.: nearly lost to faradization, but quite marked with voltaic excitation. Heart of normal size, and beating normally. In this species of frog, probably on account of their large size and toughness of the skin, much stronger solutions of lead are often required than even with large specimens of *Rana Temporaria*. In fact, I have kept one two months in a lead solution (one grain to the ounce) without being able to note any change in his condition, excepting that of active desquamation. Some of this species certainly enjoy the same immunity from the usual action of lead when injected under the skin. I kept alive and active for thirteen days a large bull-frog, which was submitted to three subcutaneous injections of four grains each of the acetate of lead,

on three successive days, beginning May 4, 1877. On May 17th the animal was found motionless. The heart was paralyzed, as in Experiment 1, and distended to twice its natural size. No contractions of this organ could be induced by the usual mode of irritation. After cutting it so as to allow the blood to escape, contractions began, nearly normal in quality. This was at 2 P. M. At 9 P. M. the muscles still retained their faculty of contracting to faradaic stimulus. At the same time (May 4th) one grain of the salt was given in the same manner to a vigorous specimen of *Rana Temporaria*, and in twenty-four hours the heart was motionless.

From these exceptional cases we have only additional proof that the power of resisting the action of this poison, which is so noticeable in the systems of painters and others, all equally subjected to the same toxic influence, exists also in individuals among the lower animals.

Analysis of a sufficient number of experiments has convinced me of the truth of the following conclusions:

I. The rapid absorption of the acetate of lead soon causes death by stoppage of the heart's action—an effect probably common to all the mineral poisons.

II. The slow absorption of this salt through the skin induces in the voluntary muscles of the frog a paralytic state, identical in its most important features with that which one sees so frequently in man.

In the acute form the motor nerves and muscles are unaffected; in the chronic form the heart is spared.

The paralysis is developed somewhat rapidly; there is no wasting of the muscles; faradization has little or no effect in inducing muscular contractions, while the voltaic current acts well in this respect;¹ cutaneous sensibility is seldom entirely

¹ The gastrocnemius and sartorius muscles were tested often in Pflüger's myographium. Polar action of electricity is not marked as in healthy muscles. Cathode closing is no more effective than anode closing. There are no opening contractions with mild currents. Contraction is slow, the organ remaining shortened for some little time during the passage of the current. The affected muscle never reacts so powerfully to either form of current as does a healthy one.

lost, and before the complete development of paralysis it often seems to be increased.¹

Microscopic examination of the web of the foot, which was made in a large proportion of cases, showed marked spasm of the arterioles, and dilatation of the venules, with consequent slowing of the circulation. The large veins of the extremities are generally congested, and sometimes varicose. The muscles are paler, and firmer to the touch than when in the normal condition, although there is no rigidity of the limbs.

My attention has been especially directed to the elements of the spinal cord. Comparison of sections of this portion of the nervous system, taken from frogs which have succumbed to the slow action of lead, with a large number made from the normal cord, has thus far shown no difference which is constant. In some cases the blood-vessels seem much increased in number and size, and the nerve-corpuscles of the anterior horns appear to be less numerous than in the healthy condition. Nothing like structural or pigmentary degeneration has been seen. The sympathetic system has not been examined.

It is almost certain that the poison is capable of acting primarily either upon the muscular substance or upon some portion of the nervous system. If the alterations are anatomical, they ought to be found. The spinal cord of batrachians is especially adapted to such researches, as the anterior horn-cells are very large, and in the lumbar region are closely crowded together in a definite, easily-determined space. Thus far I have not been very successful with Sokolow's² method in finding even the normal nerve-terminations in the muscles, but there is every reason to believe that others may be more fortunate.

In fresh preparations I have as yet found no alteration of the muscular or nerve fibres.

¹ Frogs placed in solutions of arsenious acid, bichloride of mercury, or nitrate of silver, die almost as rapidly as they do after subcutaneous injections of these poisons. With neither of these three salts have I been able to produce the same result as that caused by the lead-bath.

² "Sur les transformations des terminaisons des nerfs de la grenouille après la section des nerfs." "Arch. de Physiol.," 1874, p. 300.

Although the existence of Erb's "entartungs-reaction" is strong evidence of a separation of the muscles from their spinal nerve-cells, conclusive proof of this is only to be found by the discovery of that portion of the nervous system where the process of separation begins. The latest authorities favor the view that this affection is of neurotic origin, and their arguments lack nothing but anatomical support. Westphal with characteristic fairness freely admits the doubtful interpretation to be placed upon the changes observed in his case of radial paralysis, and it is certainly unfortunate, from a scientific point of view, that his researches cannot be more frequently made in man.¹ The close resemblance, as to symptomatology, of some cases of generalized lead-paralysis with² "spinal paralysis of the adult," in which there is much reason for accepting the coexistence of myelitis of the anterior horns, goes far to encourage us in assuming that these portions of the spinal cord are first affected by the poison in the higher animals.

May not our knowledge of the pathogeny³ of lead-paralysis acquire a surer basis than it now possesses by further researches on lead-poisoning in frogs?

¹ C. Westphal, "Ueber eine Veränderung der Nerv. radialis bei Bleilähmung." "Arch. für Psychiatrie," etc., Bd. iv., S. 776.

² E. C. Seguin, "Myelitis of the Anterior Horns," etc. New York, 1877.

³ "Zur Pathogenese der Bleilähmungen." Von Dr. Ernst Remak. "Arch. für Psychiatrie," etc., Berlin, 1875, Bd. vi., S. 1. This instructive paper contains numerous references to the literature of the subject.

ART. IV.—*Some Observations on a Series of One Hundred and Twelve Deaths.* By OSCAR J. COSKERY, M. D., Professor of Surgery in the College of Physicians and Surgeons, Baltimore, Md.

| No. | Age. | Sex. | CAUSE OF DEATH. | WHEN DIED. | | | | State of Thermometer. | State of Barometer. |
|-----|------|------|-----------------------------|------------|-------|-------------|-------|-----------------------|---------------------|
| | | | | A. M. | P. M. | Day. | Year. | | |
| 1 | 68 | M. | Apoplexy | 10.30 | ..... | April 13 | 1874 | 42° | 30.57 |
| 2 | 53 | " | Ascites | ..... | 11.30 | " 12 | " | 37° | 30.56 |
| 3 | 36 | " | Tuberculosis | ..... | 12.00 | July 14 | " | 78 | 30.30 |
| 4 | 87 | F. | Old age | ..... | 10.00 | April 24 | " | 53 | 30.15 |
| 5 | 72 | " | " | 3.00 | ..... | November 17 | " | 42 | 30.53 |
| 6 | 53 | " | Phthisis | 4.00 | ..... | January 1 | " | 35 | 30.36 |
| 7 | 71 | " | Old age | ..... | 9.45 | October 9 | " | 59 | 29.91 |
| 8 | 53 | M. | Cancer | ..... | 4.00 | August 18 | " | 90 | 30.06 |
| 9 | 83 | " | Old age | ..... | 5.00 | October 24 | " | 59 | 30.45 |
| 10 | 79 | F. | " | 11.00 | ..... | " 10 | " | 70 | 29.74 |
| 11 | 29 | M. | Tuberculosis | 7.00 | ..... | January 7 | " | 57 | 29.76 |
| 12 | 66 | " | Apoplexy | ..... | 6.00 | " 7 | " | 58 | 29.61 |
| 13 | 24 | " | Bright's disease | 2.00 | ..... | " 27 | " | 42 | 30.09 |
| 14 | 61 | " | " | ..... | 5.00 | March 13 | " | 30 | 29.88 |
| 15 | 63 | F. | Apoplexy | 12.30 | ..... | August 12 | " | 84 | 30.01 |
| 16 | 69 | " | Cancer | ..... | 10.30 | June 9 | " | 86 | 29.87 |
| 17 | 40 | " | " | 2.00 | ..... | January 20 | " | 45 | 30.01 |
| 18 | 81 | " | Old age | ..... | 1.40 | October 8 | " | 69 | 29.95 |
| 19 | 38 | " | Phthisis | ..... | 6.00 | March 6 | " | 40 | 30.20 |
| 20 | 65 | " | Paralysis | ..... | 12.30 | December 16 | " | 35 | 30.43 |
| 21 | 67 | M. | Chronic bronchitis | ..... | 1.00 | August 22 | " | 72 | 29.91 |
| 22 | 42 | F. | Cancer | ..... | 9.00 | January 29 | " | 43 | 30.18 |
| 23 | 46 | " | Phthisis | ..... | 8.30 | April 14 | " | 60 | 30.15 |
| 24 | 84 | " | Old age | 6.00 | ..... | May 6 | " | 51 | 29.80 |
| 25 | 1 m. | " | Infantile jaundice | ..... | 10.00 | " 12 | " | 59 | 30.31 |
| 26 | 34 | M. | Bright's disease | ..... | 4.05 | June 3 | " | 61 | 30.13 |
| 27 | 62 | " | Strangulated hernia | 9.00 | ..... | " 17 | " | 72 | 29.90 |
| 28 | 62 | " | Cancer | 1.00 | ..... | July 27 | " | 75 | 29.99 |
| 29 | 55 | F. | Ascites | ..... | 8.00 | " 28 | " | 76 | 29.90 |
| 30 | 18 | M. | Inflammation of spinal cord | ..... | 9.00 | " 25 | " | 79 | 30.11 |
| 31 | 70 | F. | Softening of the brain | ..... | 5.30 | October 19 | " | 59 | 30.03 |
| 32 | 43 | M. | Tuberculosis | ..... | 8.00 | January 8 | 1875 | 32 | 30.24 |
| 33 | 66 | " | Pneumonia | 9.45 | ..... | " 21 | " | 35 | 29.85 |
| 34 | 21 | " | Tuberculosis | ..... | 5.10 | " 23 | " | 36 | 29.47 |
| 35 | 35 | F. | " | 1.15 | ..... | February 10 | " | 6 | 30.54 |
| 36 | 61 | M. | Phthisis | ..... | 4.00 | " 12 | " | 32 | 30.12 |
| 37 | 21 | " | Pneumonia | ..... | 2.00 | " 23 | " | 52 | 30.13 |
| 38 | 26 | F. | Tuberculosis | ..... | 12.15 | March 4 | " | 33 | 30.29 |
| 39 | 24 | M. | " | ..... | 2.10 | " 12 | " | 62 | 29.98 |
| 40 | 53 | " | Phthisis | ..... | 3.30 | " 12 | " | 61 | 29.97 |
| 41 | 30 | " | Tuberculosis | 7.00 | ..... | " 16 | " | 49 | 29.66 |
| 42 | 67 | F. | Heart-disease | 5.30 | ..... | April 12 | " | 49 | 29.92 |
| 43 | 12 | " | Old burn | 3.00 | ..... | " 13 | " | 37 | 29.78 |
| 44 | 62 | M. | Ascites | 11.15 | ..... | " 23 | " | 52 | 29.86 |
| 45 | 47 | " | Burn | 10.45 | ..... | " 27 | " | 55 | 30.03 |
| 46 | 63 | " | Heart-disease | 9.00 | ..... | " 30 | " | 55 | 29.88 |
| 47 | 65 | F. | Ascites | 7.00 | ..... | May 2 | " | 53 | 29.60 |
| 48 | 74 | " | Cancer | ..... | 3.15 | " 5 | " | 62 | 29.94 |
| 49 | 85 | M. | " | ..... | 12.45 | " 7 | " | 60 | 30.04 |
| 50 | 46 | F. | Phthisis | ..... | 11.00 | June 5 | " | 70 | 30.00 |
| 51 | 50 | M. | " | ..... | 8.30 | " 14 | " | 68 | 30.01 |
| 52 | 66 | " | Cancer | 3.45 | ..... | " 24 | " | 77 | 30.03 |
| 53 | 28 | F. | Tertiary syphilis | ..... | 1.40 | " 25 | " | 95 | 29.95 |
| 54 | 40 | " | Cancer | ..... | 2.30 | July 6 | " | 88 | 30.01 |
| 55 | 40 | " | " | 9.00 | ..... | " 7 | " | 82 | 30.09 |
| 56 | 14 | " | Chorea | ..... | 5.20 | " 11 | " | 90 | 29.82 |
| 57 | 34 | M. | Cancer | 11.00 | ..... | August 17 | " | 74 | 29.87 |
| 58 | 57 | " | Heart-disease | 6.30 | ..... | October 7 | " | 59 | 30.02 |
| 59 | 38 | " | Tuberculosis | 6.30 | ..... | November 21 | " | 42 | 30.15 |

| No. | Age. | Sex. | CAUSE OF DEATH. | WHEN DIED. | | | | State of Thermometer. | State of Barometer. |
|-----|------|------|--------------------------------|------------|-------|-----------|-------|--------------------------|------------------------|
| | | | | A. M. | P. M. | Day. | Year. | | |
| 60 | 68 | F. | Pneumonia..... | 1.00 | ..... | November | 27 | 1875 | 46 30.03 |
| 61 | 63 | M. | Apoplexy..... | 6.15 | ..... | " | 27 | " | 46 30.16 |
| 62 | 26 | " | Tuberculosis..... | 7.30 | ..... | " | 29 | " | 44 29.99 |
| 63 | 27 | " | " | ..... | 12.30 | " | 30 | " | 21 30.43 |
| 64 | 62 | " | Cancer..... | 3.30 | ..... | December | 11 | " | 34 30.07 |
| 65 | 24 | F. | Heart-disease..... | 12.30 | ..... | " | 12 | " | 41 29.78 |
| 66 | 46 | M. | Phthisis..... | 10.00 | ..... | February | 6 | 1876 | 32 30.64 |
| 67 | 17 | F. | Tuberculosis..... | 2.00 | ..... | " | 7 | " | 34 30.33 |
| 68 | 68 | M. | Concussion of the brain..... | ..... | 4.00 | " | 11 | " | 65 29.84 |
| 69 | 67 | " | Pneumonia..... | 1.30 | ..... | " | 15 | " | 48 29.58 |
| 70 | 65 | " | Heart-disease..... | ..... | 10.00 | " | 15 | " | 33 29.73 |
| 71 | 39 | " | Tetanus..... | ..... | 2.30 | " | 19 | " | 52 30.11 |
| 72 | 75 | " | Old age..... | 8.30 | ..... | March | 12 | " | 39 30.25 |
| 73 | 73 | " | " | ..... | 5.00 | " | 18 | " | 25 29.99 |
| 74 | 23 | F. | Tuberculosis..... | 3.00 | ..... | " | 19 | " | 16 30.41 |
| 75 | 20 | " | " | ..... | 8.30 | " | 27 | " | 38 29.71 |
| 76 | 53 | M. | Phthisis..... | ..... | 2.00 | April | 5 | " | 52 29.88 |
| 77 | 19 | " | Tuberculosis..... | 10.00 | ..... | " | 11 | " | 57 30.14 |
| 78 | 90 | " | Old age..... | 9.00 | ..... | " | 13 | " | 56 29.89 |
| 79 | 50 | " | Cancer..... | 6.30 | ..... | " | 22 | " | 49 30.25 |
| 80 | 40 | F. | Phthisis..... | 11.45 | ..... | " | 25 | " | 48 30.13 |
| 81 | 70 | " | Old age..... | 8.00 | ..... | May | 29 | " | 67 30.04 |
| 82 | 81 | " | " | 9.30 | ..... | " | 29 | " | 67 30.04 |
| 83 | 25 | M. | Tuberculosis..... | ..... | 5.00 | June | 7 | " | 78 29.80 |
| 84 | 95 | F. | Old age..... | 4.00 | ..... | " | 20 | " | 72 30.01 |
| 85 | 74 | " | " | 2.00 | ..... | " | 30 | " | 76 30.00 |
| 86 | 45 | M. | Cancer..... | 11.00 | ..... | July | 1 | " | 86 30.06 |
| 87 | 29 | F. | Bright's disease..... | 11.00 | ..... | " | 6 | " | 82 30.04 |
| 88 | 39 | " | Tuberculosis..... | 3.00 | ..... | " | 9 | " | 85 30.01 |
| 89 | 65 | " | Bright's disease..... | 4.30 | ..... | " | 9 | " | 85 30.01 |
| 90 | 56 | M. | Apoplexy..... | 9.45 | ..... | " | 21 | " | 80 29.98 |
| 91 | 66 | F. | Bright's disease..... | 12.30 | ..... | August | 1 | " | 69 29.98 |
| 92 | 30 | M. | Inflammation of the brain..... | 8.30 | ..... | " | 31 | " | 74 29.97 |
| 93 | 42 | " | Psoas abscess..... | 6.00 | ..... | September | 2 | " | 74 29.78 |
| 94 | 65 | " | Phthisis..... | 4.00 | ..... | " | 17 | " | 59 29.98 |
| 95 | 19 | " | Tuberculosis..... | ..... | 3.00 | October | 17 | " | 61 29.90 |
| 96 | 72 | F. | Old age..... | ..... | 12.30 | " | 26 | " | 51 30.04 |
| 97 | 38 | M. | Heart-disease..... | 10.45 | ..... | " | 29 | " | 47 30.15 |
| 98 | 52 | " | Ascites..... | 9.00 | ..... | November | 20 | " | 48 29.57 |
| 99 | 77 | F. | Old age..... | ..... | 5.15 | December | 2 | " | 33 29.85 |
| 100 | 25 | " | Tuberculosis..... | ..... | 5.30 | " | 21 | " | 26 30.00 |
| 101 | 23 | " | " | ..... | 7.30 | " | 22 | " | 34 29.64 |
| 102 | 53 | " | Cancer..... | 3.40 | ..... | January | 1 | 1877 | 17 30.21 |
| 103 | 81 | M. | Old age..... | ..... | 2.00 | " | 8 | " | 39 29.62 |
| 104 | 71 | F. | " | ..... | 3.15 | " | 11 | " | 34 30.17 |
| 105 | 48 | M. | Phthisis..... | ..... | 5.30 | " | 19 | " | 42 30.17 |
| 106 | 61 | " | Heart-disease..... | ..... | 5.35 | February | 19 | " | 40 29.72 |
| 107 | 53 | " | Cancer..... | ..... | 8.00 | " | 2 | " | 49 30.03 |
| 108 | 6 | " | Typhoid fever..... | ..... | 11.30 | " | 9 | " | 35 30.23 |
| 109 | 71 | " | Old age..... | ..... | 1.00 | " | 15 | " | 43 30.35 |
| 110 | 36 | " | Phthisis..... | 10.20 | ..... | " | 27 | " | 42 30.28 |
| 111 | 55 | " | Apoplexy..... | 1.00 | ..... | March | 19 | " | 27 30.23 |
| 112 | 72 | F. | " | 2.45 | ..... | " | 30 | " | 40 30.01 |

Of the total number (one hundred and twelve), sixty-three were males and forty-nine females.

The great majority were cases of chronic disease (ninety-two), while only twenty were acute.

The ages at which the patients died, divided into decades, is as follows :

| | |
|--|----|
| Under 1 year of age..... | 1 |
| Between 1 year and 10 years of age..... | 1 |
| Between 10 years and 20 years of age..... | 7 |
| Between 20 years and 30 years of age..... | 17 |
| Between 30 years and 40 years of age..... | 14 |
| Between 40 years and 50 years of age..... | 11 |
| Between 50 years and 60 years of age..... | 12 |
| Between 60 years and 70 years of age..... | 27 |
| Between 70 years and 80 years of age..... | 13 |
| Between 80 years and 90 years of age..... | 8 |
| Between 90 years and 100 years of age..... | 1 |

Total..... 112

Table of the Months during which the Deaths took Place. The Top Line shows the Ages divided into Decades.

| MONTH. | 1. | 10. | 20. | 30. | 40. | 50. | 60. | 70. | 80. | 90. | 100. | Totals. |
|----------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|---------|
| January..... | .. | .. | .. | 3 | 1 | 2 | 2 | 1 | 1 | .. | .. | 12 |
| February..... | .. | 1 | 1 | 1 | 3 | 1 | 1 | 5 | 1 | .. | .. | 14 |
| March..... | .. | .. | 1 | 4 | 1 | .. | 2 | 1 | 3 | .. | .. | 12 |
| April..... | .. | .. | 2 | .. | 1 | 3 | 2 | 4 | .. | 2 | .. | 14 |
| May..... | 1 | .. | .. | .. | .. | .. | .. | 2 | 1 | 3 | .. | 7 |
| June..... | .. | .. | .. | 2 | 1 | 3 | .. | 3 | 1 | .. | 1 | 11 |
| July..... | .. | .. | 2 | 1 | 4 | 1 | 2 | 3 | .. | .. | .. | 12 |
| August..... | .. | .. | .. | 1 | 1 | .. | 1 | 3 | .. | .. | .. | 6 |
| September..... | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | 2 |
| October..... | .. | .. | 1 | .. | 1 | .. | 1 | 1 | 3 | 2 | .. | 9 |
| November..... | .. | .. | .. | 2 | 1 | .. | 1 | 2 | 1 | .. | .. | 7 |
| December..... | .. | .. | .. | 3 | .. | .. | .. | 2 | 1 | .. | .. | 6 |
| Total..... | 1 | 1 | 7 | 17 | 14 | 11 | 12 | 28 | 12 | 8 | 1 | 112 |

NOTE OF EXPLANATION.—In the column under 50, for example, all those that died over 40 and under 50 are included.

Table of the Hours between which Death took Place, together with Ages.

| A. M. | 1. | 10. | 20. | 30. | 40. | 50. | 60. | 70. | 80. | 90. | 100. | Totals. |
|-----------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|---------|
| 1..... | .. | .. | .. | 1 | .. | .. | 1 | 4 | .. | .. | .. | 6 |
| 2..... | .. | .. | 1 | 1 | 2 | .. | .. | 1 | 1 | .. | .. | 6 |
| 3..... | .. | .. | 1 | 1 | 1 | .. | .. | .. | 2 | .. | .. | 5 |
| 4..... | .. | .. | .. | .. | .. | .. | 2 | 3 | .. | .. | 1 | 6 |
| 5..... | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 |
| 6..... | .. | .. | .. | 1 | .. | 1 | .. | 1 | 1 | 1 | .. | 5 |
| 7..... | .. | .. | .. | 2 | 1 | 1 | 1 | 2 | .. | .. | .. | 7 |
| 8..... | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | 3 |
| 9..... | .. | .. | .. | 1 | 1 | 1 | .. | 2 | 1 | 1 | .. | 7 |
| 10..... | .. | .. | 1 | .. | .. | 1 | 1 | 2 | .. | 1 | .. | 6 |
| 11..... | .. | .. | .. | 1 | 3 | 2 | .. | 1 | .. | .. | .. | 7 |
| 12..... | .. | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. | .. | 3 |
| Total.... | .. | .. | 3 | 10 | 9 | 6 | 5 | 19 | 6 | 3 | 1 | 62 |

| P. M. | 1. | 10. | 20. | 30. | 40. | 50. | 60. | 70. | 80. | 90. | 100. | Totals. |
|----------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|---------|
| 1..... | .. | 1 | .. | 2 | .. | .. | .. | 2 | 2 | 1 | .. | 8 |
| 2..... | .. | .. | .. | 2 | .. | .. | 1 | .. | .. | 2 | .. | 5 |
| 3..... | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | 4 |
| 4..... | .. | .. | .. | .. | .. | 1 | 2 | 2 | 2 | .. | .. | 7 |
| 5..... | .. | .. | .. | 1 | 1 | 1 | .. | 2 | 1 | 1 | .. | 7 |
| 6..... | .. | .. | 1 | 1 | 1 | .. | .. | 2 | .. | .. | .. | 5 |
| 7..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 8..... | .. | .. | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | 3 |
| 9..... | .. | .. | 2 | .. | .. | 2 | .. | .. | .. | .. | .. | 4 |
| 10..... | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | 3 |
| 11..... | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | 2 |
| 12..... | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | 2 |
| Total... | 1 | 1 | 4 | 7 | 5 | 6 | 5 | 9 | 6 | 5 | .. | 50 |

The observations of both the thermometer and barometer were taken at the hours of 7 and 7.37 A. M., and 12.02, 2, 4.37, 9, and 11.02 P. M., and for each case of death that observation was selected that most nearly approached the hour of the death. For these observations I am indebted to Mr. R. J. Bell, United States Signal Observer at Baltimore :

Table of Thermometric Condition.

| AGE. | 6°. | 20°. | 25°. | 30°. | 35°. | 40°. | 45°. | 50°. | 55°. | 60°. | 65°. | 70°. | 75°. | 80°. | 85°. | 90°. | 95°. | Totals. |
|-------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---------|
| 1.. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 |
| 10.. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| 20.. | .. | .. | .. | .. | 1 | 2 | .. | .. | .. | 1 | 1 | .. | .. | 1 | .. | 1 | .. | 7 |
| 30.. | .. | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 1 | 1 | 1 | .. | 1 | 1 | 1 | .. | 1 | 17 |
| 40.. | 1 | .. | .. | .. | 2 | 1 | 3 | 2 | 1 | .. | 1 | .. | 1 | 1 | 2 | 1 | .. | 14 |
| 50.. | .. | .. | .. | .. | 2 | .. | 2 | 1 | 1 | 1 | .. | 2 | 1 | .. | .. | 1 | .. | 11 |
| 60.. | .. | 1 | .. | 1 | 1 | 1 | .. | 2 | 1 | 1 | 1 | .. | .. | 2 | .. | 1 | .. | 12 |
| 70.. | .. | .. | .. | 1 | 5 | 1 | 1 | 4 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | .. | 28 |
| 80.. | .. | .. | 1 | .. | 2 | 2 | 2 | .. | 1 | 1 | 1 | 1 | .. | 1 | .. | .. | .. | 12 |
| 90.. | .. | .. | .. | .. | .. | 1 | .. | .. | 2 | 3 | .. | 2 | .. | .. | .. | .. | .. | 8 |
| 100.. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 |
| T'tal | 1 | 2 | 2 | 3 | 14 | 9 | 11 | 10 | 10 | 12 | 6 | 7 | 7 | 7 | 5 | 5 | 1 | 112 |

Nearly all of these patients died in hospital, the wards being kept, winter and summer, at between 65° and 75° Fahr. The table, of course, shows the external temperatures.

Table of Barometric Condition.

| AGE. | 29.50. | 29.55. | 29.60. | 29.65. | 29.70. | 29.75. | 29.80. | 29.85. | 29.90. | 29.95. | 30.00. | 30.05. | 30.10. | 30.15. | 30.20. | 30.25. | 30.30. | 30.35. | 30.40. | 30.45. | 30.50. | 30.55. | 30.60. | 30.65. | Total. |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | | | | | | | | | | | | | | | | | | 1 | | | | | | | 1 |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 20 | | | | | | | | | | | | | | | | | | | | | | | | | 7 |
| 30 | 1 | | | 1 | 1 | 1 | 3 | 1 | 1 | 4 | | | 2 | 1 | | | 1 | | | 2 | | | | | 17 |
| 40 | | | | | | | | 1 | | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | | | | | 1 | | | 14 |
| 50 | | | | | | | | | | 1 | 2 | 1 | 1 | 1 | 2 | 2 | | | | | | | | 1 | 11 |
| 60 | | | 1 | | | | | | 3 | | 2 | 2 | 2 | 2 | | 2 | | | | | | | | | 12 |
| 70 | | | 2 | 1 | | 2 | | 2 | 5 | 2 | 4 | 5 | 1 | 1 | 1 | | | | | 1 | | | 1 | | 28 |
| 80 | | | | | | 1 | | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | 2 | | 1 | | 1 | | 1 | | | 12 |
| 90 | | | | 1 | | | 1 | | 1 | 1 | | 2 | | 1 | | | | | | 1 | | | | | 8 |
| 100 | | | | | | | | | | | | 1 | | | | | | | | | | | | | 1 |
| Total | 1 | | 3 | 3 | 1 | 4 | 6 | 4 | 11 | 6 | 12 | 15 | 8 | 11 | 5 | 7 | 2 | 3 | 1 | 4 | | 2 | 2 | 1 | 112 |

It was my intention to comment upon these tables, but the small number of cases would not allow of any laws being deduced therefrom. The object of this paper will have been accomplished if it succeeds in stimulating further inquiry of this character. These observations can now easily be made at any large hospital; and if any of your readers will collect such facts, or prepare such a table as the first one, only for the next three months, and, if he does not wish to take the trouble to analyze it, as is done in the other tables, will send it on to me, I shall gladly undertake the labor, and thank him. I feel satisfied that some tolerably exact laws can be framed.

I would suggest, besides, the addition of a column for the purpose of showing the state of the tide; but the barometric and thermometric states are the important ones.

ART. V.—*Tracheotomy. With Description of a Method specially Applicable in Young Children.* By JOHN J. REID, M. D., Visiting Physician to Charity Hospital.

THE method of tracheotomy which is here described is of special interest for its simplicity, and the rapidity and safety with which the trachea may be widely opened and kept in that position. It obviates, or reduces to a minimum, the risk of hæmorrhage, and at the same time serves to fix the trachea without the danger of compression of the larynx or trachea.

It was due to the occurrence of this latter complication, in which asphyxia ensued, that the method was devised.

To those who are not familiar with the trachea of the young, it may be well to say that children under a year have a trachea easily compressible, and not possessing that rigidity which is seen in later life; and when, in the operation of tracheotomy, the trachea is fixed by drawing it upward with a hook, compression either of the trachea or larynx is liable to occur, and, if delay ensues at that time, the danger of asphyxia is very great, and embarrassing to the surgeon. The delay referred to may result from two causes: first, the difficulty of introducing the tube; and second, and most important, the tendency which the tube has to glide along the side of the trachea but not enter the incision. When this happens, the operator only realizes his mistake when the breathing does not take place through the tube; and the loss of time consequent on rectifying the error may, and does, prove fatal.

The feeling of uncertainty at this stage of the operation is an exceedingly unpleasant feature, and the operation detailed below will prevent its occurrence in a manner which is not more obvious in the description than it is on the subject.

The operation consists in making the usual incision in the middle of the neck and dissecting up the skin. The strong superficial fascia in the median line which connects the sternohyoid muscles is then separated, and subsequently the knife is dispensed with till it becomes necessary to incise the trachea. The remaining part of the operation is performed by two uterine tenacula, and consists in tearing the deeper fascia and



FIG. 1.

drawing the thyroid veins to either side, in such a manner that the trachea is thoroughly denuded. To such an extent may this be done, that the whole of the trachea, from the cricoid cartilage to the thymus gland, may be separated from the thyroid gland and veins, and leave a free surface for incision.

After the operation has proceeded thus far, a tenaculum is inserted into either side of the trachea (Fig. 2), and slight traction made. A bistoury is then carried through the rings, as

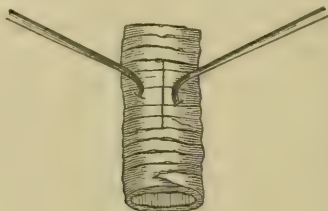


FIG. 2.

indicated in the cut, when immediately the trachea bulges open (Fig. 3), and is so maintained by the tenacula.

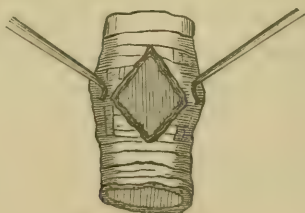


FIG. 3.

Any membrane which is in the trachea may thus be removed, and, moreover, any hurry is rendered unnecessary, as the introduction of the tracheotomy tube does not become a crisis in the operation.

In regard to hæmorrhage, which has proved so unfortunate in the hands of many surgeons, the author has made twenty careful dissections of the necks of children at the New York Foundling Asylum, and in not more than two did he find a symmetrical distribution of the superficial or deep veins; and the incision in the median line, therefore, may be as dangerous, as regards hæmorrhage, as if it were oblique; and, to insure absolute safety, care is requisite in making the section through the skin.

The advice which is usually given, to push veins aside by

the handle of the scalpel, would, in many cases, not prove so reliable a procedure as dragging them aside with a tenaculum in either hand.

In some cases the trachea seems deeply placed, from undue prominence of the muscles of the neck, and in those cases the introduction of the tube by the ordinary method is difficult indeed, and specially liable to be attended with the danger of gliding alongside of the trachea, previously mentioned. In this class of cases the tenacula are of marked benefit. As stated at the commencement of the paper, the method is considered particularly in regard to young children; but it would seem, however, that in adults its use would be attended with benefit, and at the same time enable the operator to dispense with the different instruments which have been devised for insertion of the tube.

[APPROPOS of the difficulty of performing tracheotomy in young children, the reader is referred to the article entitled "Accidents in Tracheotomy," under "Progress of Medicine" in the present issue.—ED.]

Translations.

The Hereditary Transmission of Syphilis. By Dr. M. KASSOWITZ, Attending Physician to the General Hospital for Children, Vienna. 1876. Translated for the NEW YORK MEDICAL JOURNAL by Milo A. Wilson, M. D., Clinical Assistant to Professor of Dermatology, Bellevue Hospital Medical College; late Attending Physician to New York, Northwestern, and Bellevue Dispensaries; Member of County Medical Society; Assistant Surgeon Seventh Regiment, N. G. S. N. Y., etc., etc.

(Continued from March Number.)

IV. *Can the Mother of a Child inheriting Syphilis from the Father continue to remain healthy?*—A very large number of writers who accept, as we do, the direct transmission of syphilis from the father to the embryo, through the agency of the sperm cell, believe in the possibility of a subsequent infec-

tion of the mother, without inoculation from other sources. There are, for instance, many cases in which, after the birth of one or more syphilitic children, the mother, upon examination, presents more or less pronounced symptoms of syphilis. If in such cases—on the one hand owing to a denial of the existence of a primary lesion by the mother, upon the other hand through the denial, or the absence, of local infecting lesions on the part of the father—a perplexity should arise in relation to the source of maternal syphilis, it occasions the adoption by different writers of such modes of maternal inoculation as correspond but little with general experience regarding the process of the transmission of the syphilitic virus.

These modes of transmission are :

1. The infection of the healthy mother by way of the placental circulation, from a fœtus infected by the father.
2. The inoculation of the mother by syphilitic semen at the time of fecundation.
3. The inoculation of the mother by the semen of a man with latent syphilis, but free from other inoculable lesions, independent of fecundation.

We should say at once, before entering upon the lengthy discussion of these several hypotheses, that we cannot accept any one of the three above-named modes of inoculation. The most weighty reason for this is the following :

Each one of these modes must, if they are in general possible, have an effect every time, or at least in the majority of cases, if the necessary conditions are present. Consequently every woman who has carried in her uterus for nine months, or nearly that time, a syphilitic ovum, must become syphilitic; every woman who becomes impregnated by the semen of a syphilitic man must acquire syphilis; finally, every woman must become syphilitic who has any sexual intercourse with a man in whom the disease is latent, without other inoculable symptoms. A mere accidental effect of these peculiar ways of inoculation in an isolated case, and the non-occurrence of this same effect in the majority of the remaining cases, would have really no meaning. From the above detailed statement, taken from our own and foreign experience, it follows, beyond

a doubt, that a woman can give birth to one, two, or even a succession of syphilitic children, and yet she herself must be declared as free from the disease. The bearing of one or more syphilitic children embraces, however, all three of these alleged conditions of inoculation: the long-continued sexual intercourse with a syphilitic man, the impregnation with syphilitic semen, the presence of a syphilitic foetus in the uterus during the entire period of pregnancy. We have seen that women who are subjected to all these conditions not only manifest no evidences whatever of syphilis, but that they, on the contrary, enjoy good health, and have an excellent nutrition; that, finally, they give birth to healthy children when impregnated afterward with non-syphilitic semen.

But we shall also see, on the other hand, that those cases of infection taking place in one of the three above-mentioned ways, reported by those observing them, are not by any means sufficiently proven, and that they are all very readily explainable by the generally-accepted modes of infection—namely, through the transmission of the secretion of a primary or a secondary specific lesion, or of syphilitic blood from other sources, into the maternal organism.

1. *Inoculation of the mother by the diseased ovum.*

This theory, which has attained an undeserved recognition, seems first to have been promulgated by Gardien (1824). At that time it found among syphilographers a very fruitful soil, because then these specialists denied, for the most part, the inoculability of secondary syphilitic lesions; and it therefore was very acceptable to them to be able to attribute the inoculation to the foetus instead of the husband, in whom, although the primary lesion was healed, and he was suffering merely from secondary syphilis, yet he nevertheless infected his wife.

For this reason we find this theory already fully accepted by Colles (*loc. cit.*). He observed secondary appearances in the mother during pregnancy, and even *ulcera elevata* upon the genitals. Notwithstanding, he did not consider the inoculation to have arisen in the usual way, but in the indirect

manner, through the fœtus, attributing it entirely to the absence of the primary lesion in the man.

But it was first through Ricord, who gave it the high-sounding title of "Choc-en-retour," that this theory received such an extended recognition. He imagined the process to be simply a syphilitic inoculation of the mother by the fœtus, and believed that, after such an inoculation had occurred, the syphilis of the mother ran its usual course. In one case, even, where the child became ill, at the age of two weeks, with secondary symptoms, the mother presented like symptoms at exactly the same time. Yet he also always conceded that a woman could give birth to a syphilitic child without becoming diseased herself. More recently (1863) he even restricts himself in relation to this, by declaring such a transmission as "not impossible." But as he has nowhere, to my knowledge, placed upon record his definite observations relative to this mode of infection, we consequently withhold entirely our criticism.

Diday (1854), in his work upon hereditary syphilis, accepted this view, without giving his own individual experience in relation thereto. On the contrary, he cites a single foreign case from Campbell (1844), which is as follows :

A man who had been syphilitic a long time before marriage, but presented no further conditions of a contagious character, begat with his wife, *who seemed entirely well*, four children : 1. An eight-months' miscarriage, the child living eleven days ; 2. A seven-months' miscarriage, the child living one hour ; 3. A six-months' miscarriage ; 4. A healthy child was born at eight months, after a mercurial treatment of both parents.

Notwithstanding, however, that the observer himself regarded this woman as healthy, Diday nevertheless interprets the case in such a way that, from the pretended increase of the influence of the virus upon the three first births, an augmenting infection of the mother by the fœtus may be inferred.

I have only cited this example in order to show upon what uncertain premises, and from what arbitrary deductions, theories are constructed.

Tyler Smith (1854) asserts that, if the placenta and membranes are so diseased that abortion results, the mother is very certain to become inoculated. If, on the contrary, the child is born apparently well, and only subsequently develops syphilis, the mother may, in such a case, escape infection. This entire bold theory is based upon two cases. Here, evidently, the connection of causes is entirely reversed. The mother is not infected if abortion ensues, but abortion takes place if the mother suffers from recent pronounced syphilis. If, however, the mother remains healthy, because the father is suffering from chronic syphilis, and presents no further inoculable lesions, the child has greater chances of being born living, or viable, and of becoming ill only some time after birth.

The theory of the retro-infection of the mother was very strikingly modified by Hutchinson, who, in a paper treating upon this subject, reported fifty cases in which the transmission of the disease from the foetus to the mother occurred (while in seventeen cases the mothers continued well, in spite of the syphilitic births). He, however, unlike previous observers, does not regard this transmission as a simple syphilitic inoculation, manifesting itself by a mere omission of the primary stage in the usual secondary, and finally also tertiary stages, but as *a gradual and slowly-developing syphilitic poisoning*, appearing frequently only very late, or at once with tertiary symptoms; or, again, only existing as a form of syphilitic cachexia. The women presented a pale, faded appearance; their flesh was flabby; they were asthenic, and had a tendency to pains in the extremities. In twelve women out of fifty, a falling out of the hair was observable shortly before and after confinement; eleven had ulcers upon the tongue; five, rhagades in the corners of the mouth; five had late eruptions, secondary in character; among them also condylomata, etc. All reports in relation to the disease of the father and of the children are, however, extremely deficient, or else completely wanting. Further, all data relating to the previous state of health of the mother did not in any case rest upon individual examination, but always upon the statement of these mothers themselves. The condition was also manifested, for

the most part, only after *repeated* pregnancies; consequently the first examination of the women was made very late, whereby the real beginning of the disease was a matter impossible to determine.

Hutchinson believes, for this reason, that women first manifest tertiary symptoms, because these correspond to the condition of the father at the time of the transmission of the syphilis to the child. But, having this opinion, he forgets that the hereditarily syphilitic child presents, without exception, the so-called secondary lesions also: macular and papular eruptions upon the skin, mucous membrane, etc.; that, again, if such a mode of infection is in general possible, the opportunity is constantly presented for the transmission of these symptoms also. He asserts, further, that the action of the virus is always rendered more intense through repeated pregnancies; placing himself thereby in direct opposition to the frequently-proven and generally-current view that a single, and to a certain extent instantaneous, effect of the syphilitic virus is sufficient to bring about the regular development of syphilitic processes, but that this development either makes any further increase of the syphilitic virus in the organism impossible, or seems, at least, to render the same completely ineffectual. Finally, Hutchinson does not hesitate to deduce, as a result of this supposed concentration of the poisoning in the mother, an increased influence of the virus upon the children born later; and to assert that then, upon the birth of a succession of children slightly affected and capable of life, because inoculated by the father alone, there must follow suddenly a succession of abortions and premature births. This assertion, however, is diametrically opposed to the views of all writers who have expressed themselves in relation to the consecutiveness of syphilitic births, and to my own very varied experience, which, as will be apparent from the large number of successive births submitted later, there could be recognized in each instance a regular and constant diminution of the influence of parental syphilis upon the children, until, finally, entirely healthy children were born.

Rosen (1861-'62) simply accepts the views of Hutchinson, without supporting them by individual observations.

Balfour (1856), again, observes only the usual secondary symptoms in the mothers of syphilitic children. In the four cases reported by him, syphilis constantly manifested itself in secondary symptoms immediately after the beginning of pregnancy; in one case, the mother even had psoriasis in the sixth week. In two cases he found indurations upon the nymphæ at the commencement of pregnancy (!).

The correct interpretation of these cases very closely borders upon a simple inoculation, either shortly before or just at the time of conception.

De Meric (*loc. cit.*) admits, indeed, the possibility of such inoculation from the fœtus, but believes that it need not necessarily follow, because, in twenty-three cases of syphilitic births, the women remained perfectly healthy in thirteen cases, being syphilitic in but ten. Further, he acknowledges in these latter cases his inability to exclude entirely the direct inoculation of the mother from other sources.

Émile Vidal (1860) expresses himself similarly, as he found that, in the majority of cases, the mother remained healthy. In one case of Beyran's (1862) the mother suffered from the usual secondary lesions two months after confinement. In another of Maigrots's (1863), the same were manifested even in the second month of pregnancy.

It is difficult to state positively the views of Zeissl upon this subject, as his different assertions are not entirely in accordance. Upon the one hand, he affirms: "It is of repeated daily occurrence that men suffering from secondary syphilis procreate syphilitic children without communicating the disease to their wives" (1858). Further: "By far the greater number of children born with syphilis, or who shortly afterward present symptoms of this disease, owe their inheritance to an inconsiderate father" (1875). Then he relates: "A child with a papular syphilide was the first-born of an entirely healthy woman, whose husband, before marriage, I had treated for syphilis" (1875). Again: "I saw such children [with coryza syphilitica] brought into the world, whose mothers showed no traces of syphilis" (1866). Upon the other hand, again, it is stated quite categorically, "that a mother who gives birth to a congenitally syphilitic child has always latent syph-

ilis." But the mode of origin of the maternal syphilis is also not clearly to be understood from the statements of this writer; for in one place, when stating that a woman had given birth to two syphilitic children and then had psoriasis palmaris, he evidently considers her as being inoculated by the foetus. We find stated, in another place, that the wives of men with latent syphilis, upon whom there could be found no initial lesions, after a very short time fall away noticeably in their nutrition, lose the hair of the head, suffer from periosteal nodes, etc.; consequently giving us to understand, evidently, that the inoculation occurs through the semen. According to this, these views do not admit of decision in either way.

Bryant (1872) believes in the transmission of syphilis through the agency of the foetus; but his seven observations are also very far from being confirmatory, as they are all quite readily explainable through direct inoculation.

Fränkel (*l. c.*), from whom we have already quoted, that in fourteen out of seventeen cases of hereditary syphilis he found the mother quite healthy, believes that in the remaining three cases the syphilis was transmitted from the foetus to the mother.

In the second case, the mother, who had given birth to two still-born, decomposed children, fell ill, four weeks after the birth of the third child, with ozæna. The absence of earlier symptoms is, however, not demonstrated.

In the seventh case, a primipara bore a decomposed child with osteo-chondritis epiphysaria, without other appearances. There followed, several days afterward, an eruption of flat condylomata upon one labium majorum. While, then, in the previous case, the foetal syphilis manifested itself in the mother by tertiary lesions, it appeared in this case as local condylomata.

In the tenth case, which the author did not observe himself, he was informed by the attending physician that the condylomata were not of *long standing*. It is therefore supposed that they arose through retro-infection.

Yet Fränkel acknowledges himself that the mother may be inoculated immediately at the time of a fructifying coitus,

or soon thereafter, by a secondarily syphilitic man; thus giving at once his alleged cases of retro-infection their simpler and more comprehensible significance.

To our astonishment, Bäumlér (*l. c.*) also, in his excellent treatise upon syphilis, has accepted, with the Hutchinsonian modification, although only conditionally, this puzzling and as yet unproven mode of infection of the mother.

Accordingly, with the various writers, the supposed inoculation of the mother by the syphilitic foetus takes place in two entirely different ways.

(a) The mother gives evidences of recent syphilis during pregnancy, or shortly after its termination. The mother, then, suffers from a pronounced syphilis at a time when the foetus which infects her presents itself no signs whatever of appreciable syphilis; and the foetus, although furnishing the virus, occasions the complete development of the disease earlier in the mother than in itself. All these cases are much more readily explainable in this manner, viz., that the women were inoculated by their husbands without the primary lesion having been observed. Every trace of the primary lesion upon the mucous membrane of the female genital tract disappears often after several weeks; particularly is this the case with ulcers, whose more frequent situation is upon the collum uteri. (Fournier, 1873.) The circumstance that the man denies entirely the presence, on his part, of an external syphilitic lesion at the time of pregnancy, and afterward, where it is impossible to prove to him the contrary, is not to be relied upon; because, in a man positively syphilitic, the probability of such a lesion is always more than sufficient.

(b) The mother, after the birth previously of several syphilitic children, has tertiary syphilis, or suffers merely from a cachexia, without, it is supposed, her having had either the primary lesion or any secondary symptoms. In relation to this, there are two sources of error possible: the earlier symptoms are either very insignificant and are forgotten, possibly also purposely denied, or the supposed syphilitic cachexia has nothing whatever to do with syphilis. I have frequently noticed that women, after the repeated births of syphilitic children, become anæmic, emaciated, etc. I have also observed quite

the same appearances, in connection every time with loss of hair, in the mothers of non-syphilitic children shortly after labor. Here, as in the other cases, I have found ample explanation for these conditions, in the various puerperal diseases closely following upon each other, accompanied by severe hæmorrhage in combination with bad hygiene and surroundings.

The only really noteworthy objection to the complete immunity of the mother of a fœtus afflicted with hereditary syphilis is, that if, after the birth of such a child, the mother nurses it, she is not inoculated, even although it suffers from pronounced syphilis. Colles (*l. c.*) was the first who called attention to this circumstance, which was soon confirmed by Egan (1846) and others; since then, also, this opinion in relation to this particular immunity has become a general one. It has remained, however, by no means uncontradicted. Cazenave (1847), for instance, relates that a woman gave birth to a child with specific lesions, whose father had acknowledged syphilis, and acquired, in suckling the child, ulcers upon the nipple, followed by a general exanthema. Similar cases are also reported by Brizio Cocchi (1858) and Müller (1861); but they are not described with sufficient distinctness. I myself have never been able to prove an inoculation of a mother by her congenitally syphilitic child from nursing it. In one case of undoubted inoculation at the breast, the syphilis of the child could not to a certainty be decided upon—whether congenital or acquired. Such an inoculation is, at all events, exceedingly rare, even if it ever occurs. This is certainly a very important question, which deserves to be carefully studied and clearly stated. It is really the duty of those who consider every mother of a congenitally syphilitic child as having latent syphilis, to prove the correctness of their opinion through direct experiments by auto-inoculation, even if no symptoms whatever of the disease are present. We can *a priori* by no means infer, from the fact that the mothers of hereditarily syphilitic children, as a rule, are not inoculated by them at the breast, that all the mothers of such children are syphilitic; and if, by repeated direct examinations, and also from other circumstances, the absence of every specific

symptom is confirmed, and syphilis thereby entirely excluded, such an individual must be regarded as non-syphilitic, whether she is afterward inoculated by her child at the breast or not.

2. *Inoculation of the mother by a syphilitic spermatozoa at the time of conception.*

This mode of inoculation is accepted only by Baerensprung (1864), who seems also to have fabricated it, and upon his authority by Geigel (1867) also. Baerensprung denies the retro-infection of the mother by the diseased foetus; but only for the reason that he observes that women, if they are impregnated by syphilitic men, present, ten weeks thereafter, fresh secondary lesions, which, however, are not induced by a primary inoculation, but through conception. "The semen of a syphilitic man, which, under ordinary circumstances, is innocuous to a woman, inoculates her as soon as it impregnates her." The cases which are given to prove this somewhat mysterious-sounding declaration are, however, entirely and wholly insufficient.

A man is treated for secondary syphilis; presents still, in September, erosions in the mouth, which are finally healed. He is not seen until the following March, when he relates that, having in the mean time married, his wife became pregnant in January, and has now condylomata upon the genitals, which developed from erosions in the same locality. This would, however, seem to show, evidently, an ordinary inoculation of the woman upon the genitals. (Case XIX.)

Neither do the remaining cases answer to the most modest demands regarding the plausibility of the theory assigned to them. In one instance, the supposition of the latency of the paternal syphilis rests solely and alone upon the deposition of the father himself; in another instance, slight relapses, erosions in the mouth, also during marriage, are acknowledged. Equally uncertain is the absence of the primary lesion on the part of the woman; because, in all cases, this point is investigated for the first time after there are pronounced syphilis and recent condylomata. Consequently, he who will not attribute to these cases that which does not belong to them, will judge them simply in such a way as to regard the woman as being

inoculated by her husband—affected with syphilis—at about the time of conception, and that she subsequently suffers in the usual way from general syphilis.

It is still to be remarked, that, although Baerensprung denies from the beginning the birth of a syphilitic child from a healthy mother, because he cannot imagine a conception without inoculation, according to his own peculiar view, nevertheless, in several of his cases (XXXIV., XXXVIII., XL.), he acknowledges distinctly the immunity of the mother of an hereditary syphilitic child.

3. *Inoculation by the semen of a man with latent syphilis.*

The discussion of this point should not really form a portion of this treatise, as it is one which is only concerned with the question of heredity. It is certainly a matter of indifference to the question of heredity in what manner an inoculation of the woman from external sources takes place—whether in the generally-accepted manner, through the absorption of the virus from an excoriation upon the skin or mucous membrane, or, again, in the very vague or uncertain mode, through the contact of the semen of a syphilitic man with the vaginal mucous membrane.

Only, therefore, for the sake of completeness, will we mention that this mode of inoculation, as first proposed by Egan (1851), and afterward accepted also by Behrend (1860) and Knoblauch (1861), is, according to the observations of these writers, by no means proven; that all cases allow themselves to be more simply and naturally explained by an inoculation taking place in the usual manner, and only intentionally or unintentionally suppressed; that such a mysterious event gains not the slightest degree of probability by the hypothesis of Behrend; “that, in an act of life as powerful and exciting as that of coition, such a transmission is very easily possible;” and that, finally—which seems to be the principal thing—this hypothesis is brought completely into ridicule by the numerous confirmations of the entire and continued immunity of the mother of several syphilitic children (as is even reported to be the case by Behrend himself).

All suppositions of a subsequent inoculation of the moth-

er by the foetus are, therefore, completely untenable. According to our experience, there are only two occurrences possible: either the mother of a syphilitic foetus is inoculated from external sources previous to or at the time of conception, or else during the period of pregnancy, and in consequence of this inoculation suffers from syphilis, which develops and runs its course in the usual manner; or the mother is not infected through external sources, and, as a consequence, remains always free from the disease, in spite of the fact that she has given birth to one or more children inheriting syphilis from the father. These mothers, then, differ in no way from healthy women. They are well nourished, strong, and hearty; further, they give evidence of their immunity from every form of specific disease, from the fact that they have borne a succession of children in whom is perceptible a continued and uninterrupted decrease of the syphilitic poisoning. This last would not have been possible if a syphilitic inoculation of the mother had taken place during the period of the *first* pregnancy. This recent infection, from all experience, makes itself known, at first decidedly, by the birth of intensely-diseased children, such as premature and still-births; and only the spontaneous, gradual decrease of the recent maternal syphilis can again render possible, after the lapse of many years, the birth of a viable, because more slightly affected, child. But such an interruption in the succession of births can never be observed. The decrease, in all the cases which we have already communicated, and in the larger number of those which are to follow, is much more, rather, a continual one. The mother, consequently, remains free from syphilis.

The summary of our discussions so far is, accordingly, comprehended in the following:

A woman impregnated by a syphilitic man bears syphilitic children, but remains herself free from the disease, if she be not inoculated from other or external sources.

The syphilitic virus does not pass from the foetus to the mother through the partition-wall, or septum of the foetal and maternal vascular system.

(To be concluded.)

Notes of Hospital Practice.

ROOSEVELT HOSPITAL.

Tumor of the Brain.—A case of cerebral tumor was admitted into Roosevelt Hospital on March 31st, and died in the beginning of June. The history furnished by the patient was of marked interest, when taken in connection with that furnished by Dr. A. L. Loomis, from a case of tuberculosis of the brain which he presented to the Pathological Society (JOURNAL, June, 1877, page 646).

The history of the case was as follows: An unmarried woman, aged twenty-three, entered hospital March 31, 1877, stating that five months previously she suffered from headache, coming on in the evening. The pain was located in the vertex and occiput, and was accompanied by photophobia in the right eye. Subsequent to the photophobia the vision became indistinct, or, as she termed it, misty. Some time afterward the vision in the left eye grew misty, but it was not preceded by photophobia. Ten days before admission she became totally blind. There was a certain amount of anæsthesia in the right leg, and although there was no paralysis it seemed to be weaker than that of the other side. The right arm was slightly paralyzed, but not to an amount readily appreciated. On May 1st deafness occurred in the right ear. There was also noticed anæsthesia in the left arm. The deafness increased, and on May 31st it was complete. In a few days subsultus developed, and the patient sank and died. At no time was vomiting a marked symptom, though periodically it appeared. The diagnosis of cerebral tumor pressing on the optic nerve was made by the house staff, and afterward confirmed by the visiting physician. At the autopsy, a tumor the size of a hen's-egg was found situated between the two anterior lobes of the cerebrum, pressing downward and causing a slight bulging at the base of the brain. It was anterior to the thalamus opticus, and from the history of the

case would seem to have involved first the optic nerve of the right, and then of the left eye.

In reviewing this case with the one presented by Dr. Loomis, it is interesting to find how closely they resemble each other in their clinical history, and how markedly they differ pathologically. They suggest strongly, also, a fact well known to clinical observers, that there are no rational symptoms which point conclusively to the diagnosis of a tumor of the brain.

MOUNT SINAI HOSPITAL.

Extirpation of the Uterus.—The case of sarcoma of the uterus, in which Dr. Noeggerath performed the operation of extirpation of that organ (*JOURNAL*, June, 1877, page 635), died from peritonitis.

Reaction took place in from three to four hours. This was accompanied by slight hæmorrhage, which was readily controlled. Fourteen hours after the operation the patient passed her water without difficulty, but six hours later she began to sink. Pain was complained of in the abdomen, but the symptoms of peritonitis were not very prominent, owing to the exhaustion. Death occurred thirty-six hours after the uterus was removed.

Autopsy.—Several clots were found in the cavity of the peritonæum, but their aggregate size showed that the hæmorrhage was not important. The opening into the peritoneal cavity, caused by the removal of the uterus, was partly adherent. There were signs of peritonitis in the vicinity of the removed uterus, as shown by adhesions of the intestines.

Gunshot-Wound of the Spinal Cord.—A man is at present under observation suffering from results of a gunshot-wound of the spinal cord, and presents a history closely resembling that of a noted politician who was shot during the summer of 1869. It may be remembered that, when the latter patient died, the ball was found to have entered the spinal canal and

there remained. It did not lacerate the cord, but merely pressed on it, causing paraplegia.

The case at present under observation received the wound in the back, not far from the lower angle of the scapula, the bullet entering in an oblique direction. After receiving the injury the patient fell down, and, on examination, there was found to be paralysis of both arms and legs. One month subsequently the paralysis of the arms disappeared. It is at the present time about a year since the receipt of the injury, and in that time only slight improvement has taken place, and this improvement is confined to one of the lower extremities. There is incontinence of the fæces and urine. It would seem that the paralysis of the upper extremities was due to hæmorrhage, for in no other way could an injury so far down (the eighth dorsal vertebra) involve the nerves forming the brachial plexus, unless, indeed, the ball glanced upward along the spinal canal. The theory of hæmorrhage is still further strengthened by the improvement in the paralysis a month after the injury.

GERMAN HOSPITAL.

Encephalopathie Saturnina.—A case of this rare form of lead-poisoning has been recently under observation at this hospital, and was specially interesting from the fact that recovery took place. The history was as follows: A man aged thirty-eight had for several years worked in the smelting-works of a lead-factory. For three years he suffered from lead-colic, attended with diarrhœa, which at the end of that time changed to constipation. Two weeks before entering delirium came on. It was attended with insomnia.

On admission the patient was delirious, and so much emaciated that he had the appearance of a skeleton. There were also convulsions of a clonic character, as well as a tremor of the body. There was no paralysis, either local or general. The right pupil was dilated, and the left contracted. Epistaxis occurred at intervals, but was not an important symptom.

After admission the patient was placed upon iodide of potassium to the extent of one hundred and twenty grains daily, and at night forty grains of chloral was administered. Three weeks after entering the hospital the patient began to improve, and at the present time recovery is complete. The characteristic lead-line about the gums was quite distinct, but no sign of lead could be detected in the urine.

A full description of this rare form of lead-poisoning can be found in the fifteenth volume of Ziemssen (not yet translated), which treats of toxicology. It is there mentioned that encephalopathie saturnina is the rarest form of the affection, and nearly always fatal; and the above-mentioned case, which was well marked, proves of interest in extending our knowledge on the subject.

Lumbo-Colotomy; Carcinoma of Rectum and Vagina.—A married woman, fifty-eight years of age, entered hospital with advanced cancer of rectum and vagina. She had been two years suffering from the disease, and was supposed to have piles, which caused hæmorrhage from the rectum. On examining the patient it was found that there was a cancerous mass involving both the vagina and rectum. The calibre of the rectum was so small as barely to allow the admission of the point of the little finger. Much pain was complained of during examination. It was decided to perform lumbo-colotomy, and on June 5th Dr. Stachelberg performed Amussat's operation. Previous to the operation the colon was injected with air, and on cutting through the abdominal walls it was secured and opened without difficulty. It was found that the fæces did not pass through the incision, but continued downward through the rectum. After five days, however, they passed entirely through the opening, and, as is usually found, pain in the rectum ceases in great part when fæces cease to pass over it. It is now nine days after the operation, and unfortunately there has been, within the last day or so, a tendency of the fæces to pass along the rectum.

Symes's Operation; Necrosis of Foot; Tetanus.—A man, aged forty-six, entered hospital suffering from syphilitic necrosis of the foot, which had lasted for seven years. An examination showed that the metatarsal bones were the seat of

disease. It was decided to perform Symes's operation, as offering the best chances for the patient. The stump did well, but on the third day the patient developed tetanus, which continued for three weeks. It was found necessary to administer chloroform during the active period of the tetanus, and subsequently chloral was given in one-drachm doses, morning and evening. After three months the patient was able to walk, when the stump was protected by a cylindrical apparatus.

Correspondence.

BELLEVUE HOSPITAL, *June 15th.*

EDITOR NEW YORK MEDICAL JOURNAL:

In my article in your June issue, explaining the use of Dr. Hutchinson's apparatus for the cure of popliteal aneurism, the credit of suggesting a rubber suspensory tubing should have been given to Dr. Crosby. I desire to state, also, that the ligation of the right femoral artery, in the case of Joseph Temple, was performed by Dr. Crosby, and not by Dr. Wood.

‡MARTIN BURKE, M. D.

Clinical Reports of the Demilt Dispensary.

CLASS IN GENERAL SURGERY.

SELECTED CASES BY DR. T. E. SATTERTHWAITE.¹

Pyo-pneumothorax treated by Free Incisions into the Pleural Cavity and the Insertion of Setons.—Edward Roehig, nine months old, was brought to the Dispensary on January 21, 1876. About Christmas of 1875, the child, who had previously been healthy, was taken with pain in the right side of the chest, which two weeks later became swollen, pain-

¹ Thanks are due to Dr. T. J. Loughlin for his assistance in the preparation of these notes.

ful, and had an erysipelatous look. An abscess soon formed, was opened, and liberated about "half a pint of matter," as the mother expressed it. When examined January 21st, an opening was found between the second and third ribs, about three inches anterior to the axillary line. A probe entering could be freely moved about in the pleural cavity. A flexible catheter was then introduced, and carbolic acid in a two-per-cent. watery solution was syringed in, until the cavity had been thoroughly washed out. Finding that the exit of matter was not sufficiently provided for, it was decided to introduce a seton and maintain it there as long as practicable. Accordingly, the next day a Hamilton's silver bullet-probe was passed into the opening, carried vertically downward to the bottom of the pleural cavity, and then the extremity, having been suitably bent, was pressed into the space between the fifth and sixth ribs in the axillary line. Incisions were then made down upon it and the probe drawn through. A few threads of stout ligature silk were then attached to the end of the probe, which was withdrawn, carrying the silk in through the lower opening and out through the upper one. The ends were then tied loosely together, and directions were given to apply a linseed-meal poultice, and make the child lie upon the right side. On the next day it was found that the patient had slept and nursed well, and had also taken a little brandy and beef-tea. Temperature 102° . The matter was freely escaping through both openings. Syringed out with a two-per-cent. solution of carbolic acid, until the fluid ran perfectly clear.

January 25th.—The discharge is diminishing and the patient improving. Temperature $101\frac{3}{4}^{\circ}$.

26th.—Temperature $101\frac{1}{4}^{\circ}$. Ordered cod-liver oil in half-teaspoonful doses three times a day.

28th.—The child is much worse. He slept very little throughout the night. The redness and inflammation have extended backward and downward; the side is doughy, and has the appearance of phlegmonous inflammation. The patient has refused to eat or drink, but has taken the breast. Can only get relief when carried about. Discharge is not so abundant.

29th.—Patient slept until 3 A. M. Is more easy, but weaker. The discharge is again abundant and free, and the inflammation has abated a little. Axillary temperature $100\frac{3}{4}^{\circ}$. Has taken the breast well, and sucked a little raw beef. Ordered lot. plumbi et opii to the surface, and suspend the cod-liver oil.

30th.—Child better; has slept well, and eaten. Temperature $100\frac{3}{4}^{\circ}$.

February 2d.—Patient slept well last night; has eaten two large pieces of boiled chicken and four table-spoonfuls of milk punch, and now takes the breast well. Over the upper portion of the right side of chest there are dullness and no respiratory murmur. Temperature $99\frac{1}{4}^{\circ}$. The child is still much relieved by being carried about. The discharge is diminishing.

9th.—Temperature $104\frac{1}{4}^{\circ}$. The child will eat nothing, but nurses well.

March 1st.—Matter seems to be collecting over the free border of the ribs. Opening made over the tenth rib, one inch behind the axillary line, and a tent of lint introduced.

2d.—Patient again not so well; does not sleep, but continues to nurse. Ordered quin. sulph. gr. j twice a day, together with tr. ferri chlor. gtt. 5.

8th.—Introduced a tent of oakum in the second incision; the seton still remains in place, and discharge is taking place through all three openings. Injection with a two-per-cent. solution of carbolic acid has been practised daily since the seton was first introduced.

April 26th.—Since the above note a second seton was inserted, connecting the first and second incisions. Both setons, however, were soon after withdrawn, but matter still collected both below the free border of the ribs and anteriorly to the first opening. Several attempts were made to reach the matter below the ribs, but unsuccessfully, as it was feared that the peritonæum would be opened. An incision was finally made through the muscular parietes of the abdominal wall, just one finger's breadth below the free border of the ribs, one inch in advance of the axillary line, and an abundance of a yellowish-green, offensive matter was discharged. Whether this matter was contained in an extension downward of the pleural cavity, or rupture had taken place and matter passed

down anterior to the peritonæum, could not be determined, when, however, water was injected through the original opening it passed out through the lowest ones. The other collection of matter discharged itself spontaneously. The last opening closed about May 7th, and since that time the child began to improve steadily. The duration of his attack, from the time when the first symptoms of chest trouble showed themselves until the wounds were healed, was just short of *five months*. Free incision in this instance seemed to be clearly indicated by the rules of good surgical practice; for, air having already been freely admitted into the pleural cavity, it was hardly of any advantage to think of attempting to further exclude it, and the collection of matter was therefore treated as an abscess, a counter incision being made at the most dependent part, which happened to be between the fifth and sixth ribs, as the probe could not be passed any lower downward. A seton was used rather than a drainage-tube, because it was thought that the lung, in expanding, would be less liable to mechanical injury. Aspiration was no longer an operation that was admissible, because it would have to be repeated almost daily for a period of some months, and the attendant dangers connected with the operation in a lung that was not collapsed would have been too serious for consideration. The cavity was washed out daily, and sometimes twice a day, often by a woman-friend of the patient's mother, and in this way no excessive accumulation of matter was allowed. To facilitate the escape of matter still further, the mother was directed to pull the seton through, an inch or so, whenever the outlets seemed at all blocked. A mild attack of measles occurred during the course of the treatment, but after the discharge stopped, in May, 1876, the child began to thrive wonderfully, and soon was the healthiest-looking of the family, and had no cough, though the right side was a little flatter than the other. Dr. Lockrow, Physician to the Chest Department of the Dispensary, kindly examined the child, June 8, 1877, and reported that there were flatness and diminished motion on the right side. In the upper portions of both lungs there were sibilant and sonorous *râles*. Percussion was normal, excepting in the lower part of chest, where there was dullness.

This bilateral bronchitis was thought to be of recent origin, and the lung had in all probability thoroughly expanded after the discharge from the pleural cavity ceased.

June 11, 1877.—The bronchitis is much improved.

Internal Urethrotomy Performed Twice upon the Same Person for Difficult, Deep-seated Stricture.—J. S., aged twenty-four, plasterer, came under treatment on September 22, 1875, for retention. Finding it impossible to pass any instrument through the urethra, even under ether, the bladder was punctured *per rectum* by Buck's delicate curved trocar, and the urine was removed. Ordered quin. sulph., ten grains, in coffee immediately, and repeat to-morrow, and take tinct. ferri mur. in ten-drop doses daily.

September 24th.—A whalebone guide was successfully passed, over which an Otis's urethrotome No. 4 (curved) was slipped, and on which it was gently pushed forward into the bladder. The stricture was met at about seven inches from the meatus. Dilatation was practised up to 30 F. S., when the spear-point knife was slid down the groove, and pushed to the extremity of the instrument. The patient did well, and, notwithstanding there was considerable hæmorrhage, was about the streets daily. No. 16 English (26 F. S.) was introduced a number of times, and the patient passed from under observation.

On July 17, 1876, he returned with his old trouble. No. 7 French was passed with difficulty, and dilatation carried up to No. 12 French. Resistance was met at five and a half inches from the meatus, and at three other points lower down.

On January 24, 1877, the patient returned again with retention. No instrument other than a whalebone guide could be entered. No cutting instrument being at hand, the patient was etherized and aspirated above the pubes, five and a half ounces of urine being withdrawn. Quinine and iron were then given as before.

January 26th.—The patient was again etherized, and no instrument but a whalebone guide could be passed. Otis's urethrotome (No. 4) was then threaded upon it as before, and advanced as gently as possible into the bladder. Some little force was required to cut through the stricture. It was

then dilated to 35 F. S., and the cut was made with the spear-shaped knife. There was some hæmorrhage, but it soon stopped. The largest sound on hand (28 F. S.) was then passed easily into the bladder. Iron and quinine were given as before.

28th.—The patient has had pretty constant hæmorrhage, which has now stopped. Sound 30 (F. S.) introduced, and on withdrawing it a little blood comes away.

The patient subsequently had a little irritability of the bladder, and a little hæmorrhage followed introduction of sounds, but both of these passed away in about ten days.

Internal Urethrotomy for Traumatic Stricture.—M. F., aged thirty, single, stableman, while taking a carriage from an elevator at a livery stable, fell over the axle, injuring himself so that he was laid up for thirteen months. At the end of this time he was having great difficulty in passing water, and in July, 1875, urination was only by drops, but he thought that he attempted to make water at least fifty times a day. The patient being etherized, a whalebone guide was found to be the only instrument that could be passed into the bladder. An Otis's dilating urethrotome (No. 4) was then threaded on the guide, and passed downward through the stricture. The urethra was then dilated, and the stricture cut.

In March, 1876, the patient returned, and stated that since the operation his stream had always been full.

June 8, 1877.—Patient says that his stream has remained full. Passed a No. 18 (F. S.) sound with ease. The patient's penis is remarkably small.

This method of operating was resorted to in a number of other cases where tight, deep-seated strictures existed, and always with success. In one case only of stricture it was found impossible to introduce either a whalebone guide or a filiform bougie, and this case was a traumatic stricture of twelve years' duration. The patient was sent to a hospital, where Cock's operation was successfully done. In one instance there was some extravasation, where Maissonneuve's instrument had been used, but the patient was not accessible at the time this complication occurred, so that proper subsequent treatment was impossible.

Hydrarthrosis of Knee ; Repeated Aspirations.—C. K., aged thirty-four, married, harness-maker, came under treatment in October, 1875, for a swelling of the left knee-joint. He first felt trouble there in 1867, though in all the intervening time he had experienced no pain in it. Previous to this attack he had specific disease, and found that, when taking large doses of iodide of potassium (eight drachms a week), the swelling disappeared. The iodide was accordingly ordered, in equally large doses, but failed to have the desired effect. At the advice of Prof. Markoe, who saw him, and corroborated the diagnosis of hydrarthrosis, the joint was aspirated, and nine ounces of a thick, rather turbid serous fluid withdrawn by Potain's instrument. When examined microscopically there was a considerable deposit of pus found in the fluid. The aspiration was conducted with care, the smallest needle being used, every effort being employed to exclude the air, which was accomplished by compressing the knee about the needle with firm bandages, and then, immediately after the removal of the needle, covering the point of puncture with a bit of adhesive plaster. The patient then walked home.

In a few days he returned, and the knee was much smaller. Five ounces were then withdrawn. This fluid contained almost no pus.

In April, 1876, eight ounces of fluid were withdrawn at one time, and four at another. The fluid was now clear. The patient had been much troubled with night-sweats, for which he took cod-liver oil with iron.

May 28th.—The patient's general constitution much improved. Has no cough. The effusion in the knee is less in amount. During all this time the patient has never ceased working at his trade, and has walked to and from his work as usual.

June 6, 1877.—Four ounces of effusion removed by aspiration, the same precautions being used as before, and the patient walking home. Examination of the chest by Dr. Lockrow revealed a depression on the right side in the third interspace ; increased vocal fremitus in the infra-clavicular region, with slight dullness ; cavernous and prolonged respiration. The left side is normal. The trouble appears to have been

an old one, no longer active; and, indeed, the patient's general health has much improved during the last eighteen months. He has now neither cough nor night-sweats.

11th.—The patient, after returning home, removed the bandages, and since then has been attending to his work without any application whatever to the knee.

Proceedings of Societies.

NEW YORK PATHOLOGICAL SOCIETY.

Stated Meeting, May 23, 1877.

Dr. E. G. JANEWAY, President.

Gangrene of the Appendix Vermiformis.—Dr. ERSKINE MASON presented, on behalf of a candidate, a portion of intestine including the appendix vermiformis. The history of the case was to the effect that the patient, a man of eighteen, was suddenly seized with a chill, followed by pain in the abdomen and other signs of peritonitis. After two days the symptoms improved for a short time, but on the third day death took place. At the autopsy the appendix vermiformis was found to be in a gangrenous state, and lodged in it was a foreign body the size of a pistol-bullet, and of the consistency of charcoal. Fibrine was found in the neighborhood of the caput coli.

Sudden Death following Parturition.—Dr. PUTNAM-JACOBI presented the heart taken from a primipara who died from dyspnœa five hours after labor. The dyspnœa continued for two hours. There was no coma. The interest of the case rested on the fact that at the autopsy no lesions were found. A clot was found in the right ventricle, extending into the pulmonary artery, but from its appearance it was *post mortem*.

Dr. JANEWAY suggested the possibility of poisoning in cases where no lesions were found to account for the symptoms.

Fatty Degeneration of the Placenta.—Dr. S. CARO presented a placenta which was obtained from a woman delivered that morning of a still-born child of eight months of fetal life.

The mother was forty-two years of age, and had been married twenty years. In that time she had fifteen children, of which the first only was living. All of the children, with the exception of four, were born gasping, but subsequently died. She had one child each year, until the last four years, when an interval occurred. Chlorate of potash was given in large doses, with the intention of checking the tendency to miscarriages, but without effect. Lugol's solution of iodine was also used, but without benefit. No history of syphilis could be obtained.

Varicose Veins removed.—Dr. A. C. Post presented a specimen of varicose veins which he had removed from a patient at the Presbyterian Hospital. The history was to the effect that for twenty years the patient had suffered from enlarged veins, and for the past few years there was an ulcer of the leg which proved obstinate to treatment. Dr. Post determined on the removal of the veins as a radical cure of the disease. The operation was conducted under the influence of the carbolic-acid spray. For twenty-four hours the patient did well, but at the end of two days signs of phlebitis were evident. The temperature rose to 104°, and the saphenous vein was inflamed as far up as the inguinal region. Quinine was given freely, and blisters applied along the course of the inflammation. Subsequently the patient recovered. The specimen showed that the extirpated veins were much indurated.

Excision of the Elbow to cure Persistent Ulceration in a Cicatrix.—Dr. Post also presented specimens of bone which he had removed from the elbow-joint of a child nine years of age. The history was as follows: An extensive burn of the anterior portion of the elbow was received from burning clothing. The late Dr. Gurdon Buck endeavored to rectify the contraction which ensued, and in his attempts at straightening the arm the brachial artery was severed. The patient subsequently came under the care of Dr. Post. Another attempt was made to straighten the arm, but there resulted a fracture of the olecranon process. After the fracture was repaired, an ulceration on the anterior part of the elbow was found to continue. It was decided to perform excision of the elbow-joint, and two months after the operation the

ulceration was found to be healed. Slight motion existed in the joint.

Excision of Wrist.—Dr. POST also presented the carious carpal bones removed from the wrist of a patient thirty-five years of age. As a result of lifting a heavy weight, synovitis of the wrist occurred, which passed on to the destruction of the joint, and caries of the carpal bones. Excision was performed, and for nine days the patient did well. At the end of that time the temperature increased to 104°. This, however, soon sank to normal. After three weeks erysipelas appeared, but passed away. Subsequently Bright's disease occurred, and the patient died.

Empyema.—Dr. ROBINSON presented a specimen of circumscribed empyema caused by fracture of the ribs.

Exsection of the Ankle.—Dr. ERSKINE MASON exhibited a girl to the Society upon whom he had performed the operation of exsection of the ankle-joint. The history of the case was as follows: The patient, aged thirteen, entered Roosevelt Hospital October 10, 1876. Seven years previously she suffered from a sudden pain in the ankle. This continued, and after six months several openings occurred around the instep. On admission to hospital, sinuses were found which led down to necrosed bone in the vicinity of the joint. It was considered advisable to perform exsection. The leg and foot were subsequently put up in plaster-of-Paris dressing, and the patient did well. When she was presented to the Society, complete cure had taken place. The extremity was shorter than its fellow, but by means of a shoe with a high heel she was enabled to walk comfortably. At the operation the malleoli and articular surface of the fibula were removed, as well as the whole of the astragalus.

Report of the late Dr. Charles A. Budd's Case, with Presentation of Specimen.—Dr. CHARLES K. BRIDDON presented a specimen of popliteal aneurism which he had removed from the late Dr. C. A. Budd. The history of the case was as follows: During September, 1871, Dr. Budd was seen for the first time by Dr. Briddon, and said that for a year previously he had suffered from pain along the course of the sciatic nerve, but that, while crossing the ocean a few months previously, he had

wrenched his knee. He detected little out of the usual way, however, till the day he called on Dr. Briddon, when a swelling made its appearance in the right popliteal space. On examination, a pulsating tumor with bruit was found over the course of the popliteal artery. The pulsation was arrested by compression of the femoral, and it was found, on continuing the pressure, that collapse of the tumor took place. It measured two and a half inches transversely by three inches vertically. Treatment was commenced by giving sixty grains of the iodide of potassium daily, and at the same time injecting a solution of ergotine into the neighborhood of the aneurism. These injections were soon discontinued, and there was then commenced treatment by genuflexion. This was continued for two hundred and seventy hours. At the end of one hundred and five hours consolidation manifested itself, and at the end of two hundred and sixteen hours digital pressure was made over the femoral artery. The result of the treatment was to diminish the tumor one-third. After a week pressure was again had recourse to, by an instrument specially designed for the purpose. Three points were selected in the course of the femoral artery, and pressure made upon them alternately. This was continued for ten hours a day for fifty-six days. At the expiration of that time the aneurism was found to be diminished to the extent of two-thirds, and had a very feeble bruit. There was no subsequent increase in its size. During the time that genuflexion was being practised opiates had to be freely given, but when compression was used there was but little pain.

During the summer of 1874 Dr. Budd suffered much from intercostal neuralgia; and in February, 1875, Dr. Briddon noticed an aneurismal bruit in the dorsal region, between the scapula and vertebræ. Much pain was complained of, and relieved only by the free use of hypodermics. Early in 1877 there was found to be difficulty in swallowing, which continued till May 17th, when the patient died of collapse.

Autopsy.—Left pleural cavity contained thirty ounces of coagulated blood, and an equal amount of serum; the lung was bound down to the chest; the right lung was emphysematous; the aneurism filled the chest, and had caused the

erosion of five of the vertebræ, and absorption of the second and third dorsal; the popliteal aneurism was found to have sprung from the anterior wall of the artery, and was thoroughly consolidated, with the exception of a channel which existed through the fibrine, and allowed of the circulation being carried on. The vessel was found to be atheromatous.

Stated Meeting, June 13, 1877.

Dr. E. G. JANEWAY, President.

Osteo-Sarcoma.—Dr. STIMSON presented several specimens of bone which he had removed from a patient who had originally suffered from osteo-sarcoma of the femur. Six months after amputation of the thigh the patient died, and, on examining the end of the femur, there were found osteophytes, but no sign of the original disease. In the lungs there were found nodules which showed the presence of bone-cells, and on the frontal bone was a node about an inch in diameter and a third of an inch high. On the dura mater, immediately beneath this, there were found several bony concretions.

Dr. HEITZMANN said that when osteo-sarcoma returned there was usually noticed a greater bony formation. In regard to the conveyance of osteo-sarcoma and cancer in the system, Dr. Heitzmann said that osteo-sarcoma was carried by emboli, whereas cancer was disseminated by means of the lymphatic system.

Amputation of Leg.—Dr. H. B. SANDS presented the foot and lower half of the tibia and fibula which he had removed from a boy aged twelve. The case was specially interesting, inasmuch as the amputation was performed to remove a foot rendered useless by the unfortunate result of fracture of the tibia and fibula at their lower third. The history of the case was as follows: When one year old, the patient fell and broke both bones of the leg. The fracture was treated by placing the limb in pasteboard splints. The result, however, was unfortunate, inasmuch as there followed an angular deformity at the point of fracture. The child was taken to Sweet, the

bone-setter, but without any benefit, and was afterward taken to an orthopedic institution in Philadelphia, when four years of age, and a refracture of both bones was accomplished. After consolidation had taken place the patient was dismissed cured. The deformity gradually returned, and eventually became worse than it had been previously. A brace had been applied, but with only slight benefit. When the case came under the care of Dr. Sands, the broken bones were found united at a right angle. The tibia was fractured at a point two inches above the joint, and the fibula four inches above the joint. The limb was to a great extent useless, and it was deemed best to amputate it. An examination of the specimen showed that the fracture was not completely ossified, but admitted a slight amount of motion. The bones were much more slender than normal.

Chondro-Sarcoma of Left Antrum.—Dr. SANDS presented an interesting specimen of chondro-sarcoma of the left antrum, which ultimately extended so as to almost entirely destroy the encephalon. The history of the case was as follows: During November, 1872, the patient was first seen, when he was suffering from a tumor of the antrum, which caused the left eye to protrude. This was scooped out as thoroughly as possible, and for some time considerable improvement took place. After two years, during which time he was able to work, he entered Roosevelt Hospital, in June, 1874, suffering from epileptic convulsions. When he had been in hospital for a few months he rallied so much as to be able to go to Europe. He returned the following year much improved, and strongly convinced that he was cured. In 1876 the disease made another advance. It showed, by protrusion of the eye and atrophy of the optic nerve, that pressure was being exerted from below. During June, 1876, a second operation was performed. This consisted of exposing the periosteum of the orbit, cutting through the bone, and scooping out seven ounces of a gelatinous mass. On the second day he was able to sit up, and after two weeks he left hospital, but was readmitted in November of the same year. The left eye was then markedly protruded. The vision in the right eye was bad. Paroxysms of headache were complained of, and on January 1st he was

both blind and deaf. On May 3d death took place. Toward the close of the disease the deformity was hideous. An examination of the specimen showed that the tumor invaded the cranial cavity, and caused compression and absorption of a large amount of the cerebral substance. The extent of the invasion might be more readily appreciated by comparing it to an orange which rested on the roof of the mouth and extended upward to the roof of the skull. A point of interest in the case was, that the man lived so long with such a deficiency of brain-substance. The tumor was of gelatinous consistence, and could with difficulty be retained in the skull till it was hardened in alcohol.

Cystic Cancer.—Dr. HEITZMANN reported that a specimen of stomach and liver, presented by Dr. J. C. Peters last November, proved to be cystic cancer.

Dr. ROBINSON presented some phosphatic calculi which had been passed by a patient.

Epithelioma of Leg.—Dr. R. F. WEIR presented a leg which he had amputated. The following is the history: A man aged thirty-two had an ulcer of the leg, which continued for sixteen years. It was about two and a half inches in length, and at times discharged bone. Six months ago the granulations became of that warty variety characteristic of epithelioma. It was found that the bone was greatly eroded. The glands in the groin were found enlarged. It was considered best to amputate. This was done through the expanse of the articular surface of the femur. The operation was performed four weeks ago, and since that time the patient had done very well. An examination of the extremity showed that there was sloughing phagedæna of the bone.

Vesico-Rectal Fistula.—Dr. WEIR also presented a specimen showing the presence of a fistula extending between the bladder and rectum. The patient complained, ten months ago, of difficulty in passing his water, and at the time it was suspected that he had stone in the bladder. On examining the case, evidences of vesico-rectal fistula were apparent, and the diagnosis was rendered certain by injecting the bladder with milk, which was found to pass into the rectum. The anus was forcibly dilated to allow the gas to pass out of the rectum.

Considerable benefit followed this procedure. The galvanocaustic was applied to the fistula to bring about closure of the opening, but without much benefit. The patient died on June 9th. When the bladder was examined, an opening was found in the prostatic portion which communicated with the rectum. There were abscesses in both kidneys.

Ilio-Cæcal Abscess.—Dr. POST presented the history of a case of ilio-cæcal abscess. A boy, twelve years of age, was sick seventeen days when he came under observation. At that time there was swelling of the abdomen, which was most noticeable in the iliac region, and filled up that side. An incision was made and a large amount of pus evacuated. The patient subsequently recovered.

Rupture of Vertebral Artery.—Dr. JANEWAY presented a specimen showing rupture of the vertebral artery near its junction with the basilar. The patient died suddenly from hæmorrhage at the base of the brain. There was also an aneurism of the basilar artery, the size of a pea, which had not ruptured.

PATHOLOGICAL SECTION OF THE KINGS COUNTY MEDICAL SOCIETY.

Regular Meeting, December 14, 1876.

The President, Dr. GIBERSON, in the Chair.

Dr. ROCKWELL presented a specimen removed from a lady eighty-eight years of age, who, twelve years ago, was thrown from a car, and fractured the neck of the left femur. She remained in bed two months, used crutches for two or three years, but was finally able to walk without them.

Last June she fell down-stairs, striking the same hip, and the attending physician found the right clavicle fractured, and what he supposed to be a *refracture* of the femur.

Dr. Rockwell saw her two days after the injury. The limb was three and a half inches short, with marked crepitus. He considered refracture most probable, *but she had been able to walk a little since the fall*. Hypostatic pneumonia developed, and she died on the seventh day after the injury.

At the autopsy the original fracture was found ununited; the neck had been absorbed, and the patient had walked for years on a fractured femur, which had made a new socket for itself just over the acetabulum, the head being *in situ*, and having maintained its vitality by means of a filament of membrane connecting it with the rest of the bone.

The PRESIDENT had seen a gentleman of seventy-six who had pain, called rheumatic, in the right hip for a month, but still walked about. On examination, a contusion was found, with thickening of the neck and shortening of the limb.

Dr. Rockwell had seen two other cases where locomotion was possible after fracture of the neck of the femur.

Dr. McCORKLE presented a mammary tumor removed from a maiden lady aged forty-three. Her general health was not good. Ten years ago she observed a mass the size of a walnut, which perceptibly enlarged during menstruation, but was entirely free from pain. For two years it has been larger, but was not the source of pain till November, 1876, when, during menstruation, the breast became suddenly and painfully engorged. Dr. Skene was consulted, and advised excision, which was done under ether on November 18th. The tumor consisted of a small cyst containing polypoid growths and a grumous fluid.

Dr. WESTBROOK presented a specimen from a man aged sixty, who fell, on September 31, 1876, striking on the left trochanter. He was removed to the Long Island College Hospital, where the limb was found shortened more than one inch. He soon became delirious, and finally demented, and died on November 12th. Very marked pachymeningitis was found; the femur was one and five-eighths inch short, the cervix having split the trochanter and become impacted. The shortening was greater than usual, less than an inch being most common.

Dr. MATHEWSON presented a cystic tumor removed from the brain of a victim of the fire at the Brooklyn Theatre, December 5, 1876, which was the means of the identification of his body.

He came to the Eye and Ear Hospital, March 3, 1873, having choked disc O. S. . V. = $\frac{2}{4} \frac{0}{0} +$, and was able to attend

to his business. The right lens being opaque, the fundus could not be examined. He had dizziness at times, but never lost consciousness; had no paralysis, and no aberration of mind or senses. He was carefully watched, but his condition remained unchanged, except that his sight *improved*, and his case was presented at the late International Ophthalmological Congress as remarkably rare. Being a theatre-goer, and missing after the fire, he was supposed to have perished.

On the evening of December 7th Drs. Shepard and Segur were requested by the coroner to hold an autopsy on a few of the bodies, with a view of ascertaining whether the immediate cause of death was asphyxia or not. Half a dozen bodies having been fortuitously selected from the hundreds of charred remains, there was found, on removing the calvarium of one of these, a tumor lying in the middle fossa on the left side, and on the greater wing of the sphenoid. Dr. Shepard, having been familiar with the history of this case, and the man being among the missing, this clue led to the identification of the body, remnants of his clothing, buttons, etc., being recognized on examination by his friends. The tumor was pedunculated, about the size and shape of a human eye, its walls thin and composed of loose fibrous tissue, and its contents partly of a cheesy consistence, partly fluid, both parts containing abundant granular cells. Point of attachment not made out.

N. B. SIZER, *Sec.*

Obituary Minute concerning Dr. Gerhard Hutchison.—This section is called upon to signalize an event that has impressed the minds of all of us as peculiarly sad—mournful almost to bitterness—in the untimely cutting off of the life and promising career of our esteemed young associate member, NATHANIEL GERHARD HUTCHISON.

This loss is worthy of notice by us in words sincere though brief; for death, by one sharp blow, has made very brief the record, Dr. Hutchison having had less than two years in his chosen profession. That he had not been inactive in those short years, will be seen by the account, by no means complete, that follows:

Dr. Hutchison was born in 1853, and at the date of his death had not yet entered his twenty-fourth year. Although

a native of Missouri, he had spent most of his life in the city of Brooklyn. In 1871 he began formally the study of medicine under his father, Dr. Joseph C. Hutchison, our fellow-member, whose only son he was. He was graduated from the Twenty-third Street School in 1875, and in that year opened his office at 119 South Oxford Street. Previous to this, however, he for a short time was *interne* to the Kings County Hospital, and Assistant Surgeon to the White Star Line, plying from New York to Liverpool.

He united with this section early in 1876, presenting, with history, a specimen of cardiac hypertrophy with aortic stenosis. He became Attending Surgeon to the Orthopædic Infirmary and Assistant Surgeon to St. Peter's Hospital. He was also elected to the position of Assistant Surgeon of the Twenty-third Regiment. He was not remiss as to his professional obligations to record his experience with the pen. He read a paper before the County Society on "Synovitis treated by Aspiration," which appeared in the "Proceedings" of May, 1876.

During the early part of April, 1877, he was in continuous attendance on several cases of virulent diphtheria, to which he gave unremitting care. For the relief of one of these the operation of tracheotomy seemed to be demanded, and he zealously addressed himself to the performance of it, although at the time not feeling in his accustomed health. Diphtheria soon after seized him, and he succumbed from its brief but most painful attack on April 10th.

Thus was a valued life snatched away, but not before he had left the good name, and the lesson of it, of a diligent student and a conscientious devotee to his profession. His death was clearly due to his strict obedience to the calls of duty; but not only so: there was in it that heroic element of self-forgetfulness that leads us inevitably to mentally compare the fate of our associate with that of the brave soldier who falls in his first campaign, or of the volunteer in some rescuing life-boat, or the betrayed bearer of a flag of truce.

His mortal remains rest in Greenwood.

(Signed)

R. M. WYCKOFF, }
A. L. LOWELL, } *Committee.*

Presented and approved May 24, 1877.

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, June 7, 1877.

Dr. S. S. PURPLE, President.

Automatic Reduction of Luxation of the Head of the Femur.—Dr. A. B. CROSBY described a case of automatic reduction of the hip, which he accomplished by means of a method practised by Dr. Allen, of Vermont. The method consisted in flexing both legs at right angles to the thighs, and both thighs at right angles to the abdomen. When in this position, the operator, by means of hands placed beneath the knees, lifted the patient off the bed, and by gradually swinging him from side to side the dislocated head of the femur slipped into the acetabulum. Dr. Crosby said that Dr. Allen devised the method accidentally, in the following way: He was lifting a patient from one side of the bed to the other, and, while holding him until the clothing was arranged, the bone slipped into the acetabulum. Dr. Crosby read from Dr. Bigelow's book the different methods which have been practised, and although many of them closely corresponded with the method described, yet in none of them was there an absence of interference which would make the process automatic. Dr. Crosby also showed a dissection of the hip-joint which had been made by Dr. Wyeth. The specimen demonstrated the origin and insertion of the ilio-femoral or Y-ligament.

Bibliographical and Literary Notes.

ART. I.—*Transactions of the Medical Society of the State of New York for the Year 1876.* 8vo., pp. iv.-412. Albany: Van Benthuysen. 1876.

THE address of the president, Dr. T. F. ROCHESTER, of Buffalo, is well calculated for a centennial dissertation, is very erudite, and abounds in the early history of the profession in

this State, giving also some interesting incidents in the lives of the eminent men of early days.

The first scientific article which appears is the "Meritt H. Cash' Prize Essay," entitled "What is the Comparative Physiological and Therapeutic Action of Free Phosphorus and the Hypophosphites," by SAMUEL R. PERCY, M. D., of New York. Inasmuch as the subject of the article was not such as to entitle the author to a prize, the paper was simply commended by the Society. The author claims that free phosphorus is not only worthless as a medicine, but that it is positively injurious, and poisonous to the system. The oxides, it is claimed, should always be employed. His views are based upon experimental facts.

Of the communications, Dr. SAYRE, of New York, contributes a practical article on "The Treatment of Rotary Lateral Curvature of the Spine, with Practical Demonstrations upon a Patient." The treatment consists in a plaster-of-Paris jacket to be worn by the patient.

Dr. WHITE, of Buffalo, furnishes a "Report of a Case of Chronic Inversion of the Uterus." The author, who may be said to be the father of the operation reducing the uterus when in this condition, believes there is no such thing as irreducible inversion; he also thinks the difficulty of reposition as great immediately after the completion of the process of involution as at any subsequent period; and this twelfth case of uniform success in reduction is adduced in support of these views.

Dr. GOUTLEY, of New York, presents a good paper on "Stone in the Bladder; its Spontaneous Expulsion, and its Removal by Lithotripsy and Perineal Lithotritry, with an Analysis of Thirty-five Cases."

"Diseases of the Lachrymal Duct, with new Suggestions respecting Strictures at its Inferior End," is the title of a very practical paper by Dr. H. D. NOYES, of New York.

Dr. BEACH, of Gloversville, N. Y., reports a "Case of Retention of Urine caused by Hypertrophy of the Prostate Gland, treated by the Aspirator; also Report of the Autopsy and of the Microscopical Examination of the Kidneys."

"A Case of Vegetating Epithelioma of the Cervix Uteri, with Sub-Involution of the Uterus, and Pelvic Cellulitis; with

Remarks upon its Pathology and Symptomatology," is reported by C. E. FRASER, Jr., M. D., of Rome, New York. It was previously read before the Oneida County Medical Society.

Dr. L. D. BULKLEY, of New York, contributes an interesting article "On the Use of Ergot in the Treatment of Purpura." The same gentleman also reports a case of "Unrecognized fatal Variola Hæmorrhagica in the Mother, followed by fatal Confluent Variola in the Child; with an Account of the supposed Source of Contagion from Unrecognized fatal Variola Hæmorrhagica and Unrecognized Varioloid."

Dr. N. FANNING, of Catskill, New York, reports a case of "Fungus Cerebri;" Dr. J. V. KENDALL, of Baldwinsville, New York, "A Case of Tetanus after Miscarriage;" Dr. T. DIMON, of Auburn, "A Case of Disorganization of the Brain without Corresponding Loss of Function;" and E. H. PARKER, M. D., describes "The Hypodermic Injector—A Substitute for the Hypodermic Syringe."

Next follows the "Report of Dr. E. R. SQUIBB, as Delegate to the American Medical Association, on the United States Pharmacopœia"—an elaborate and pointed article; also a very elaborate "Report of the Committee on Hygiene."

"Early Medicine in New York: A Centennial Contribution," is furnished by R. M. WYCKOFF, M. D., of Brooklyn.

A "History of the Medical Society of Livingston County, New York," by Dr. LAUDERDALE, of Geneseo, New York, was originally read by its author before that Society. The paper comprises an account of the formation of the Society, and a condensed abstract of its proceedings until 1876.

Obituary notices, lists of members, etc., complete the volume. In the list of county medical societies Livingston is omitted. The discussions add value to the papers. The volume is presented in very creditable style.

ART. II.—*Transactions of the American Gynecological Society*. Vol. I. For the year 1876. Boston: H. O. Houghton & Co. Cambridge: The Riverside Press, 1877.

A TOLERABLY full abstract of the material contained in this volume was given in the report of the proceedings of the

Society, so that an extended notice of the many excellent papers is not necessary in calling attention to the very handsome volume in which they may be found complete. The proceedings of the first meeting alone constitute a valuable addition to the literature of gynecology; while the manner in which it is published is highly creditable alike to the editor and publisher.

BOOKS AND PAMPHLETS RECEIVED.—On Idiocy and Imbecility. By William W. Ireland, M. D. (Edinburgh), Medical Superintendent of the Scottish National Institution for the Education of Imbecile Children at Larbert, Stirlingshire; Author of the "History of the Siege of Delhi," "Studies of a Wandering Observer," etc. London: J. & A. Churchill, 1877. Pp. 416.

On Sexual Debility and Impotence resulting from Stricture and Inflammation of the Curved Portion of the Urethra, with Special Reference to Masturbation as an Exciting Cause of Stricture. Read before the Philadelphia County Medical Society, March 28, 1877. By Samuel W. Gross, A. M., M. D., Surgeon to the Jefferson Medical College, and to the Philadelphia Hospital. Reprinted from the *Medical and Surgical Reporter*, May 5th.

Alcohol: As a Food and Medicine. A Paper from the "Transactions of the International Medical Congress at Philadelphia, September, 1876." By Ezra M. Hunt, A. M., M. D., President of the American Medical Association on State Medicine and Public Hygiene, etc. New York: National Temperance Society and Publication House, 1877.

An Atlas of Topographical Anatomy, after Plane Sections of Frozen Bodies. By Wilhelm Braune, Professor of Anatomy in the University of Leipzig. With 46 Woodcuts. Translated by Edward Bellamy, F. R. C. S., Senior Assistant Surgeon to Charing Cross Hospital, Lecturer on Anatomy, etc., etc. Philadelphia: Lindsay & Blakiston, 1877.

Review of Dr. Squibb's Proposed Plan for the Future Revision of the United States Pharmacopœia: Being a Special Report upon this Subject by the Committee of the National College of Pharmacy on the United States Pharmacopœia, and Resolutions adopted by the National College of Pharmacy, Washington, D. C., at a Special Meeting held May 28, 1877. Pp. 8.

How to Use the Ophthalmoscope: Being Elementary Instructions in Ophthalmoscopy. Arranged for the Use of Students. With 35 Illustrations. By Edgar A. Browne, Surgeon to the Liverpool Eye and Ear Infirmary, and to the Dispensary for Skin-Diseases, etc. Philadelphia: Henry C. Lea, 1877. Pp. 120.

Transactions of the Pathological Society of Philadelphia. Volume VI. Containing the Report of the Proceedings for the Session from September, 1875, to July, 1876. Edited by James Tyson, M. D., Professor of Genera

Pathology and Morbid Anatomy in the University of Pennsylvania, etc. Philadelphia: J. B. Lippincott & Co., 1877. Pp. 158.

A Synopsis of Private Obstetrical Practice for Forty-two Years previous to January 1, 1876. By William Ingalls, M. D. Reprinted from the *Boston Medical and Surgical Journal*, April, 1877.

Poisonous Effects of Cyanide of Potassium. By Joseph Jones, M. D., Professor of Chemistry and Clinical Medicine, University of Louisiana, etc. From the *New Orleans Medical and Surgical Journal*, May, 1877.

The Respiratory Brace: a New Appliance devised for the Relief of Orthopnœa. By George F. French, M. D., Portland, Me. Reprinted from the *Boston Medical and Surgical Journal*, May 3d.

Fruit and Bread. A Scientific Diet. By Gustav Schlickeysen. Translated from the German by M. L. Holbrook, M. D. With an Appendix. Illustrated. New York: M. L. Holbrook & Co.

An Introduction to Practical Histology. By George Thin, M. D. London: Baillière, Tindall & Cox, 1877.

Tracheotomy in Diphtheria. By J. H. Pooley, M. D., Professor of Clinical Surgery in Starling Medical College, Ohio. Pp. 22.

The Specialty of Diseases of Women. By Clifton E. Wing, M. D., Boston.

The Discovery of Anæsthesia. By J. Marion Sims, M. D. Reprinted from the *Virginia Medical Monthly*, May, 1877.

Reports on the Progress of Medicine.

REPORT ON LARYNGOLOGY.

No. X.

By GEORGE M. LEFFERTS, M. D.,

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2. HIRSCHBERG.—On the Various Methods of Inspecting the Larynx. *Virchow's Archives*, Bd. lxi., Heft 1, January 12.
3. BOCHFONTAINE.—Tumor of the Laryngeal Ventricle in a Dog. *Soc. de Biol.*, January 6.
4. PEANCELLIER.—Certain Considerations on the Spasmodic Laryngitis of Children, in its Various Clinical Forms. *Thèse de Paris*, No. 427, 1876.
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6. WHITTAKER.—On Laryngeal Tumors. *The Clinic*, September, 1876.
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8. FREIDENREICH.—A Laryngeal Polypus extirpated by the Galvano-Cautery. *Hospital Tidende*, iii., 46, 1876.
9. BESCHORNER.—Extirpation of an unusually Large Laryngeal Polypus. *Jahresb. d. Ges. f. Natur. u. Heilk. in Dresden*, 1875-'6, p. 112.
10. SYMIAN.—A Contribution to the Study of Tertiary Syphilitic Laryngitis. *Thèse de Paris*, No. 17, 1876.
11. HANSEN.—A Case of Paralysis of the Abductor Muscles of the Vocal Cords (of Syphilitic Nature); Cure. *Petersburgh med. Wochensch.*, No. 6, 1876.
12. DELENO.—Section of Both Wings of the Thyroid Cartilage, by a Gouge (Chisel); Death from the Passage of Blood into the Air-Passages. *Ann. de l'Oreille et du Larynx*, March 1, 1877.
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 36. LANGENBECK.—Necrosed Nasal Bones Swallowed and Arrested in the Oesophagus. *Memorabilien Jahrg.*, xxii., Heft 1.
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 46. RUMBOLD.—A Simple Mode of Cleansing the Nasal and Pharyngo-Nasal Passages. *Chicago Med. Jour.*, May, 1877.
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 48. BROWNE.—On the Causes of Dyspnœa in Cases of Suffocative Bronchocele, and on the Surgical Treatment most Advisable. *American Jour. Med. Sci.*, April, 1877.
 49. MARTEL.—On Laryngeal Syphilis. *Thèse de Paris*, No. 59, 1877.
 50. McDOWELL.—Tracheotomy and its Advisability in Certain Forms of Syphilitic Disease. *Med. Press and Circular*, March 28, 1877.
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 52. KRISHABER.—A Contribution to the Study of the Mechanism of Stridulous Breathing in Man. *Idem*.
 53. QUINQUAND.—A Case of Primitive Encephaloid Cancer of the Right Tonsil, with Degeneration of the Corresponding Lymphatics; Death; Autopsy; Histological Examination. *Idem*.
1. Beschornier's contribution consists of a case of laryngeal papilloma of considerable extent, which he removed by means of the *écraseur*, after the preliminary performance of tracheotomy. The case is interesting as demonstrating how rapidly and extensively a papilloma can reproduce itself. At eight months and five months respectively after the original operation it was necessarily repeated (without the tracheotomy).

14. Schnitzler, in his *brochure*, truly remarks that, though a general diagnosis as regards a narrowing of the larger air-passages is comparatively easy, it is often a matter of some difficulty to determine accurately the nature of the cause, especially its locality and etiology. The functional disturbances caused by a laryngo-tracheo-stenosis do not always assist to an appreciation of its cause and seat; and, besides the clinical history, a careful external inspection of throat, larynx, and trachea, and percussion and auscultation of the lungs, a thorough laryngoscopic examination will be necessary to give clearness and certainty to the diagnosis. He divides the causes of narrowing of the larger air-passages as follows: First, into *intra-laryngeal* or *tracheal stenosis*, dependent upon disease of the organs themselves; *extra-laryngeal* or *tracheal*, due to affections of the neighboring parts; and finally, that due to the presence of foreign bodies in the larynx or trachea.

Diseases which may cause more or less stenosis of the larynx or trachea, *intra-laryngeal* and *intra-tracheal stenosis*, are as follows: All inflammations of the mucous membrane and the submucous tissues of the parts (laryngitis catarrhalis, crouposa, diphtheritica, phlegmonosa), especially when œdema occurs; all the different ulcerative processes, especially in phthisis and syphilis, with their sequelæ (neoplasms and cicatrices); finally, diseases of the perichondrium, or of the cartilages themselves (perichondritis, necrosis, etc.).

Among the affections of the neighboring parts, enlargement of the lymphatics is the most common cause of *extra-laryngo-tracheo-stenosis*; less frequently other tumors (neoplasms of the neck); furthermore, tumors and neoplasms of the mediastinum (aneurism of the aorta, degeneration of lymphatics, medullary cancer), osteitis of the sternum, and hypertrophy, as well as that of the bodies of the vertebræ; finally, affections of the pharynx and œsophagus, may all give rise to the condition under consideration. Foreign bodies, which frequently lodge in the air-passages and give rise to stormy, even fatal, symptoms of stenosis, are thrown out of consideration in the article, and the remaining two classes of causes alone dwelt upon. A careful analysis of the rational symptoms of stenosis, together with a thorough review of its physical causes, follows, the latter being illustrated by cases and drawings.

17. The *Monatschrift für Ohrenheilkunde*, No. II., 1877, contains the description of a new procedure by Voltolini, by which he manages to remove intra-laryngeal growths without either special instruments or a mirror. He simply swabs out the larynx, and in so doing tears off the soft polypi. The swab consists of a flexible wire to which is attached a sponge, whose diameter does not exceed, at the utmost, one millimetre. The sponge, having previously been softened in water and then pressed out, is introduced "blindly" into the larynx, which closes upon it. No attempt should then be made to advance or press downward until the larynx opens again. If this takes place, as is very often the case, then the swab must be passed up and down between the vocal cords. In favorable cases, when the sponge is withdrawn the polypi will be torn off. The method is only applicable to comparatively soft growths. It is thought that after the diagnosis has once been made any practitioner may be able to do the operation successfully. Voltolini gives six cases in which this simple method was pursued.

19. Dr. Porter remarks that the laryngeal complications in phthisis are troublesome and persistent. Irritation may be relieved by inhaling vapor from heated lime-water; or, if there are swelling and thickening, a solution of tannic acid may be applied with the brush, followed in a few minutes by a solution of morphia. Where the infiltration about the arytenoid cartilages is excessive, he is in favor of injecting the distended

mucous membrane with a few drops of tincture of iodine by means of a hypodermic syringe, which, entering at one side externally above the superior margin of the thyroid cartilage, should pass downward and backward, when, by aid of the laryngeal mirror, the operation may be completed. If the needle is of small calibre, long, sharp, and slightly curved, there need be but little difficulty. Some pain follows, succeeded by diminution of the thickening and contraction of the mucous membrane.

24. A child two years old was admitted to St. Joseph's Hospital on the 5th of July, 1873, with an acute laryngitis. Croup and diphtheria were excluded in the diagnosis. At six o'clock in the morning urgent dyspnoea demanded tracheotomy. During the introduction of the canula so much difficulty was encountered that the child in the mean time became asphyxiated, and was only revived with difficulty. The trouble was repeated each time the canula was removed for cleansing, while in the intervals the breathing was good and full. During the dressing on the 9th of August, violent cough expelled the rusty half of a steel pen, and on the 13th the second half followed. The canula was removed on the 17th, and the little patient discharged cured on the 21st.

26. In view of the recent discussions concerning the value of india-rubber tracheotomy-tubes, from a surgical point of view, it may be interesting to note that a patient of Dr. House, who was wearing one that had become rotten, broke it off short on attempting to remove it. It was subsequently removed from the right bronchus, into which it had fallen.

27. Dr. Griffith recommends the following application to the ulcerations in the severe and very painful sore-throat of scarlatina: Chloral, five grains; glycerine, twenty-five grains. After this has been applied with a brush the pain is much diminished, and the patient can swallow medicine or food without the severe pain which the action caused before.

28. All practitioners who have devoted special attention to the treatment of diseases of the upper air-passages have probably met with just such cases as are presented by Dr. Holden in his very interesting and suggestive article under the above heading. They have probably also been at a loss to account for the occurrence of symptoms, some of an aggravated and persistent nature, which were referred to the pharynx and larynx as their seat, but which existed without appreciable lesion of these parts, or which, furthermore, persisted after the comparatively slight (in many cases) grade of hyperæmia or chronic catarrhal inflammation which existed had been relieved by appropriate medications. This being the case, the doctor's paper has a practical worth, in calling attention to the sympathetic and reflex character of such symptoms, and in opening up a comparatively unworked field of observation, that renders it an unusually valuable one. One can but wonder, with him, that as yet so few detailed accounts of these cases have appeared in medical literature. In many of the works upon diseases of the throat general reference is made to various neuroses of the larynx and pharynx due to a reflex uterine irritation, or to hysteria, but few special instances have been detailed at length. These references are as follows:

Ziemssen, "The Neuroses of the Larynx," etc., "Cyclopædia," vol. vii. p. 931. Wendt, "Neuroses of the Naso-Pharyngeal Cavity," *Ibid.*, p. 109; also vols. xi. and xii., Ziemssen's "Cyclopædia." Christofori's, *Lyon Médicale*, November, 1876 (Case). Malachio, *Revue de Thérap. Méd. Chir.*, October, 1875, p. 795 (Case). Turek, "Kränkheiten des Kehlkopfes," p. 431. Mandl, "Maladies du Larynx et du Pharynx," p. 759. Tobold, "Kehlkopf-Krankheiten," p. 343. Gibb, "Diseases of the Throat," p. 323, *et seq.*

From the four cases given at length in the original article, we have selected the following, as being perhaps the most typical—at least, one which illustrates fully the nature and symptomatology of the affection:

"The first in which uterine difficulty seemed responsible for the pharyngeal irritation was that of Miss C., aged thirty-two, who came under ob-

servation in September, 1867. Intense aching pain, apparently just behind and the whole length of the posterior pillars of the pharynx, was complained of, and was of so annoying a character at times as to prevent sleep. There was no redness, nor, indeed, any visible disease. The pain was but little aggravated by swallowing, and had been occasionally better for days together—rarely ever lancinating, or other than a slow, torturing ache; if worse at one time than another, possibly when fatigued; was inclined to think worse toward night, but was not positive. She had been formerly a patient of Dr. Green, of New York, and always obtained relief from the application of nitrate of silver, the strength of which she did not know; had never heard him state his opinion of the difficulty, or give it a name; said that four or five applications were required at intervals of three days; could not say whether the pharynx was red or inflamed on these occasions. This patient was treated, when first under my care, in the manner common at that time, viz., with the local application of a solution of nitrate of silver; successfully, it appears, although in the December following a return of the difficulty rendered a renewal of treatment necessary. After the second recovery the patient called, and with great reluctance stated that she was wearing some kind of uterine instrument, introduced five years before by a physician in Vermont, and that she had suffered more from it than from her throat, but had dreaded even the mentioning of the fact to a physician. Briefly to cover this part of the case, I would say that I removed an ordinary martingale ring, which I have before me in writing, and which measures in its outer diameter *two and one-quarter inches*, eroded in places, and so imbedded in the tissues as to be removed with great difficulty. She stated the fact—which then made no impression, however—that when the aching in the loins and back was at its height, the throat was well. Considerable ulceration of the cervix was found, of a superficial character, which must have readily healed, as no notes appear of treatment for several months. The patient could not remember what symptoms she experienced before the ring was inserted, but was told that she had ‘falling.’ So far as remembered, the pain in the throat and the uterine derangement began at about the same time.

“Since the period above described (1867) this patient has been under observation, and, as she assures me, has been under the care of no other physician.

“From one to three times yearly the pharyngeal pain has returned, and on one or two occasions it has been accompanied or followed by subacute pharyngitis, and once by considerable dyspnoea, but most frequently without a single visible evidence of congestion, inflammation, infiltration, or follicular disease. The affection was often intractable, and never until within two years suspected to be dependent upon any uterine difficulty. Other cases, some of which are given below, called up the circumstances of the early treatment, and the discovery resulted that in every instance, except when inflammatory difficulty had arisen from exposure and ordinary colds, uterine derangements coexisted. This was frequently a displacement, from too protracted use of the sewing-machine, or profuse leucorrhœa, from a like cause; sometimes an irregularity of menstruation, with ovarian pain; and within the past two years (since examinations have been made for the purpose) erosions of the cervix uteri have been found. No local application to the pharynx has been made since this discovery, and relief speedily follows removal of the uterine difficulty.

“It may be suggested that some form of stomach-derangement, particularly that of acrid gastric secretion, might have given rise to the pains, as this is a common and familiar cause of pharyngeal irritation; but, aside from once entertaining this view and finding treatment unsuccessful, no symptoms of such difficulty were present in the cases included in this cate-

gory. That the trouble was simply an ordinary neuralgia, seemed improved by the character of most of the cases, and the absence of other neuralgias and the subsidence of the pain upon cure of the uterine disease.

"All the cases, with but one exception, were observed in those well-to-do in the world; and although ordinary hysteria was not so frequent as to be noted in any case, the pain would seem justly to deserve the term hysterical, if we use it as originally designed, viz., a neurosis connected with *η ὑστέρα*."

29. Dr. A. H. Smith presented, at the meeting of the New York Pathological Society held March 14th, a tumor removed by operation from the soft palate of a patient who had come to him from the interior of the State with a diagnosis of malignant disease. The growth projected but slightly into the mouth, but the whole of the space behind the velum on the right side, and the adjacent pharynx, was occupied. The growth was about the size of a butternut. About two years ago the patient first discovered a small growth in the soft palate, which gradually increased until it became the size of an almond. At that time the physician who saw the case advised the application of caustic. The result was the formation of an eschar, which, when separated, gave issue to a considerable amount of glary, mucous-like fluid. The wound healed, and for a time it seemed as if the difficulty had entirely disappeared. A year ago last December the growth again commenced to show itself, and continued to increase until Dr. Smith saw him. He formed the opinion that the tumor was of that variety first described by Nélaton as adenoid. Extirpation was advised, and performed accordingly. The operation was very simple, and consisted merely in the division of the mucous membrane over the tumor, and shelling it out with the finger pressed from behind. The only embarrassment was in consequence of the cicatrix, which had to be divided with the scissors. The patient during the operation was placed in Rose's position, with the head over the edge of the table. The recovery was rapid and complete.

Dr. Smith remarked that the clinical features of these tumors were slowness of growth, painless character, freedom from attachment to mucous membrane, and their non-liability to pass beyond the raphe of the soft palate.

30. Legroux has written an able and valuable *résumé* and critical review of all the articles on the subject of ulcerative pharyngitis—either of a chronic catarrhal, a scrofulous, or tuberculous nature—which have recently appeared in French literature; and the attention which has of late been paid to the subject has drawn forth many papers from experienced pens. His article, then, has a practical importance, as presenting much digested information which is valuable for the purposes of reference, and may be consulted with profit by those whose studies tend in this direction, or who are writing upon the subject. For their information, a list of the authors and articles which are summarized in the original paper is translated and appended. The paper itself, being partly of the nature of an abstract, cannot be further condensed without losing some of its value, and the readers of this report are therefore referred to it for further details.

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Lesions of the Buccal and Pharyngeal Mucous Membrane," *Thèse de Paris*. 1875. Medical Society of the Hospitals, "Numerous Observations and Discussions, by Isambert, Bucquoy, Lancereaux, Desnos, Raynaud, Lailier, Vidal, Dumontpallier," *Report of Proceedings*. Anatomical Society of Paris, *Bulletin of January*, 1875, Cases by Rendu and Exchaquet. Isambert, "On Acute Miliary Tuberculosis of the Pharynx and Larynx," *Ann. de l'Oreille et du Larynx*, May, 1875. Numerous observations by the same author, found in the thesis of Koch (*see above*), or communicated to the Medical Society of the Hospitals, *Transactions*, 1872-1876. Gee, "On Tuberculous Angina Faucium," *St. Bartholomew's Hospital Report*, 1875. Medical Society of the Hospitals, "Tuberculosis of the Throat," Cases and Discussions by Bucquoy, Raynaud, Lancereaux, Paul, Sireday, Hayem, Laveran, etc., *see Reports of Society*. *See also* the abstract of Fraenkel's article on "Miliary Tuberculosis of the Pharynx," which appeared in No. IX. of the "Report on Laryngology," with the contained references to the German literature of the subject.

33. Two analogous cases to the one above, described by its title (*see Bibliography*), have been reported in Germany by Emmert and Luschka. Bitot's case makes the third which has been observed of this peculiar defect of conformation. A fœtus of seven months presented a bifurcation in the median line of the inferior maxilla, and certain other modifications of the various bones of the face, which proved in a conclusive manner that an original bifurcation exists at some time in the symmetrical parts of the head. The nasal fossæ posteriorly were imperforate, the obstruction being due to the presence of two triangular bones, of a more or less regular shape, articulating above with the sphenoid, below with the *os quadratum*, or the horizontal portion of the palatine bone. Exteriously their borders corresponded with those of the internal wings of the pterygoid apophyses, while interiorly they impinged one upon the other, and formed a median fissure.

In Emmert's case, the condition was not incompatible with the child's existence; it simply necessitated an operation. In the other two cases, it coexisted with other and even more serious anomalies.

36. Dr. Langenbeck reports this curious case: A woman, aged forty, who for four years had suffered from syphilitic caries of the nasal bones, one morning, on awakening, was unable to swallow. Attempts to probe the œsophagus with a sound were fruitless. Although the patient protested that she had swallowed nothing, the sound was thrust against a hard body, stuck fast halfway between the pharynx and stomach, and for a space of three days scarcely a drop of fluid had been able to enter the stomach. Renewed attempts were made to remove the foreign body, but without success, and for the next twenty days the patient received nourishment only by the rectum. The final and successful attempt at removal was conducted as follows: The exhausted patient was propped up in bed, and a long whalebone sound was introduced into the gullet—one end sharp, the other terminating in a conical knob. After a half-hour's manipulation the knob on the probe, with a slight pressure, passed the constriction, and a lateral and upward movement finally occasioned a perceptible movement of the foreign body, which an hour later was thrown out suddenly by vomiting. The body was found to be the hard bones of the nose, adherent to each other—namely, both inferior turbinated bones, the vomer and the left side of the *os nasi* proper—which had been swallowed by the patient while asleep. The patient recovered quickly, and at present (six weeks later) is strong and hearty. Through the retching there was an enlargement of the œsophagus and thereby easier expulsion of the foreign body occurred by the *vis a tergo*.

37. Dr. Von Vajda showed a man, aged twenty-four, who had suffered from syphilis three times. Seven months ago he had a tumor as large as a pigeon's-egg on the septum nasi. It was supposed to be a syphilitic gumma, especially as there were nodes on the tibiae and other indications of syphilis. About two months since (after an absence of two months) the patient returned. The swelling was somewhat smaller, but was covered with numerous fungoid excrescences as large as hemp-seeds, which bled freely.

Careful rhinoscopic examination showed that the tumor was not sharply defined posteriorly, and the microscope showed that its substance consisted of small and large round cells along with some spindle-cells, and giant cells with numerous nuclei. Some of these cells had undergone mucous degeneration, like that observed by Wagner and Virchow in gumma. The Doctor diagnosed the tumor as a sarcoma, and Dr. Heschl confirmed the diagnosis. He pointed out the difficulty of diagnosis in such cases, and remarked that in gumma the connective-tissue elements rarely showed signs of proliferation; also, that in malignant growths the cells, and in gumma the intercellular substance, were the chief seats of mucous degeneration.

40. Robinson says that hitherto the general practitioner and specialist have alike regarded hypertrophy of the turbinated bones as an ordinary and almost necessary sequela of chronic nasal catarrh.

According to his belief, however, this appreciation is only in part correct. Without doubt, so-called hypertrophy of these bones is frequently met with; and it is usually true that sufferers from this morbid condition will, when questioned, give a catarrhal history.

Nevertheless, we should not be misled by such facts; for, though hyperplasia of tissue in the nasal fossæ is frequently apparent in instances of chronic inflammatory trouble of these passages, it is a result which proceeds as much from improper treatment as from the disease itself. Patients thus affected have been treated, in the majority of instances, during weeks and months, by the repeated application of douches, injections, or sprays to the Schneiderian membrane. These all act in a very similar though more or less injurious manner. By their contact the mucous membrane is irritated again and again, and before long it becomes turgescient and angry-looking, and the secondary consequence is serous or plastic infiltration of the mucous and submucous tissues. In chronic catarrh it was formerly thought that the bones themselves became enlarged, and hence the use of the term "hypertrophy of the turbinated bones." In point of fact, this is seldom true. Real hypertrophy, when it exists, has a different seat from the bone itself. It is situated in the erectile *stroma*, or reticular structure which lies between the periosteum covering the bone directly and the mucous membrane which bounds the outer wall of the nasal fossæ. Here we have a formation analogous, or almost similar, to that of the labia majora or penis, which is readily irritated, and capable of rapid augmentation in size and equally rapid collapse. These changes—occlusion of the nasal passages, intermitting with periods of time when they are free—may depend partly upon a deviation of the septum nasi, and sometimes upon an accidental or customary position, where the mere action of gravity will notably exaggerate local infiltration. Possibly the turgescence or collapsus of erectile tissue in this region, and more particularly over the inferior turbinated bones, is under dependence of the vaso-motor nerves, which are here distributed, and are, as we know, very sensitive to external impressions. They will undoubtedly react, in this place as elsewhere, to all kinds of irritants, mechanical or other, and they will be influenced also more or less by the emotional sentiments. Thus the doctor explains how it is that an inflammatory occlusion of the nose may change rapidly from one cavity to the other.

This quick-shifting state is proximately brought about by a greater or less amount of functional activity in the smooth muscular fibres which form a component part of the trabeculae and walls of the closely-juxtaposed cavities, and this activity is finally attributable to the influence of nerve filaments in a hyper-sensitive condition. The stimulus itself of these peripheral nerves may be either of direct or reflex origin; and cold hands or cold feet may cause obstruction of the nasal passages as effectually and rapidly as an irritant locally applied.

As regards the treatment of the affection, Robinson believes that, if the cases of hypertrophy of the soft tissue over the turbinated bones be properly treated in their initial stage, we should not be called upon to care for this disease in its ultimate period. He advises banishment of the nasal douche, care in the frequent or prolonged use of even medicated sprays, and, unless astringent or alterative powders remedy the local condition sufficiently for quiet breathing through the nose, in a brief lapse of time, attention should be directed toward operative procedure. This consists in evulsion of the mucous membrane by means of a strong pair of slightly-curved forceps, and is regarded by the doctor as the readiest and most effectual method of accomplishing a radical cure.

41. A. B., aged thirty, probably syphilitic, struck the bridge of her nose, five years ago, in falling. The nose remained tender and swollen for two or three months, and the nasal passages became so much obstructed that she was scarcely able to breathe through them. Six months after the injury a fetid discharge commenced. At the time of examination the nose was flattened, and both nostrils reduced to little more than pin-hole apertures. The soft parts between the nose and upper lip were deeply ulcerated, and the fetor arising from the discharge was beyond all description. The probe, introduced with difficulty, detected no dead bone. Ordered to take full doses of iodide of potassium, and wash out nasal cavities with Condy's fluid. Two months and a half later, as dead bone could be felt with the probe, and the patient was anxious that something should be done to relieve her, she was operated on according to the plan of Rouge, of Lausanne.

The right corner of the upper lip was seized by the operator and the left by his assistant, and by this means the lip was everted and drawn upward, while the soft parts were separated by a clean sweep of the scalpel, cutting upward, with its edge close to the bone. The incision extended from the second bicuspid tooth on the right side to that on the left. By drawing upon the upper lip, the nose, together with the soft parts forming the anterior portions of the face, could be easily raised in such a manner as thoroughly to expose the nasal fossæ. A large quantity of dead bone could now be both seen and felt, and was easily removed by the finger and forceps. The operation was completed by replacing the lip in its natural position, and retaining it there by a strip of plaster.

There was scarcely any bleeding during the operation. The wound healed rapidly by first intention, without the slightest scar or deformity. All discharge ceased, the ulcerations healed, and there was not the slightest fetor to the breath.

The doctor remarks that this method of operating is one of the greatest importance and value, and would seem justifiable not only in cases of ozæna—which, according to recent observations, are dependent, in a large majority of cases, on a sequestrum or carious portion of bone, even if an examination fails, as in some of Rouge's cases, to detect it—but also in some cases of polypi or other growths, for the entire removal of which a considerable space and more complete view are necessary. In the case above narrated, it was not found necessary to cut through the cartilaginous septum at its attachment to the anterior nasal spine, it having been previously destroyed by disease; but in ordinary cases, before the nose can be lifted, this should be done with scissors.

The case with which the above operation was done, the thorough exposure of the nasal fossæ, the absence of hæmorrhage, and the beneficial results obtained, agreed, according to the author, with the cases described in Rouge's able paper. (*Nouvelle Méthode Chirurgicale pour le traitement Chirurgical de l'ozéne*, Lausanne, 1873.)

42. Du Bois, in his paper, remarks that ulcerations of the septum of the nose are often as much the cause of persistent discharge from the nos-

trils as erosions of the os uteri are the cause of leucorrhœa. He has seen many cases that, under the care of specialists, have for the time being been cured, only to break out afresh. In truth, these cases seem to require general as well as local treatment. Looked at from one standpoint, they are but a sign of a general constitutional state. The treatment pursued by most specialists is tedious, requiring the attendance of the patient several times a week for several months, before the ulcerations are completely healed and the discharge stopped.

Many of the cases that come to the general practitioner would be satisfied if they could get a partial cure—i. e., be able to control the discharge from the nostrils to such an extent as not to be seriously inconvenienced thereby. It is a question, in some of these cases, as to the advisability of stopping suddenly a long-continued discharge. The treatment that he has found most convenient for the patient, and at the same time very effective locally, has been the use, night and morning, of vaseline with five grains of salicylic acid added to the ounce. This is introduced into the affected nostril by a camel's-hair pencil, or, better still, by a little cotton-wool wound around the end of a stick. At the same time he gives $\frac{1}{100}$ to $\frac{1}{50}$ grain of corrosive sublimate with some preparation of iron twice daily. He frequently finds that, after this treatment has been continued for one to two months, a complete cure is effected; while in other cases the discharge has so far ceased after a few weeks, that the patient, being satisfied, leaves off the treatment.

46. The simple mode of cleansing the nose and pharyngo-nasal passages alluded to consists of the common expedient, long employed, of snuffing up into the nostrils saline solutions of varying degrees of strength and temperature, which have been poured into the palm of the hand. The idea is a very old one, and the method is very extensively resorted to, not only by the laity without medical advice, but by them with the consent and approbation of their medical attendant. In dispensaries, and among the poorer classes who are unable to purchase any form of apparatus, it is of necessity the one that is commonly recommended; although its advisability, regarded from the standpoint of safety, is questioned by some. In the present paper the subject is treated in a manner that presents an old friend under a new and attractive guise, and the woodcuts and explanations of the *modus operandi* will do much to further the correct understanding and consequent scientific use of a method that is often resorted to empirically.

47. Bridge's apparatus consists of a perforated tube, to be introduced along the floor of the nostril, when fluid is propelled through it by means of a hand-ball attachment. The fine sprays or streams of liquid, being thrown directly upward when the tube is in position, will reach the upper parts of the nasal cavity—a locality usually unreached by the ordinary forms of apparatus. The instrument is probably intended for a modification of that of Rumbold, termed the "catheter nasal douche."

50. McDowell, in his interesting paper, states that the question as to the advisability of performing tracheotomy in syphilitic disease of the larynx often becomes one of life or death, and that no class of cases are calculated to cause more anxiety to the surgeon, and, in certain instances, to require more vigilant treatment. He has met with two instances of death as the result of laryngeal spasm, caused by destructive syphilitic ulceration extending down to the larynx, and, in the face of such experiences, does not doubt but that cases are met with in which tracheotomy becomes a positive necessity. In support of his position, he quotes Bryant as saying that, when ulceration has commenced and seems to be unaffected by general treatment, the subject of tracheotomy claims serious consideration; for, unless the organ of voice and respiration can be kept quiet,

repair will not go on; and, as long as progressive ulcerative disease exists, a sudden spasm of the larynx is imminent, and also the death of the patient. The operation should, however, only be undertaken when the disease is steadily progressing in spite of treatment, and it is clear that the larynx will be destroyed, as a vocal as well as a respiratory organ, unless some steps be taken to stop its progress—and of these steps there are none equal to tracheotomy; for all surgeons are familiar with the fact that, even under the most extreme conditions of disease, repair goes on in the larynx directly the tube has been introduced and physiological rest is given to the organ. Hilton, speaking upon the same subject, expresses himself as follows: In chronic laryngitis cured by tracheotomy, the cure is not effected by opening the larynx, but by giving the larynx rest. The operation is performed in reference to these two circumstances—in reference first, no doubt, to securing the continuance of life by allowing the patient to breathe through the tracheal tube; secondly and ulteriorly, the object is to give rest to the diseased part. In the performance of tracheotomy for disease of the larynx, the surgeon never touches the disease at all; he merely enables the patient to breathe through the tracheotomy-tube, and diverts the stream of air away from the larynx, thus giving the larynx the opportunity of recovering itself.

In conclusion, McDowell states that the two forms of syphilitic ulceration of the larynx in which tracheotomy is called for, are either of the phagedænic or serpiginous type, and that a distinction must be drawn between them. The former is much the most common, and will be found to pronounce itself generally in naturally weak and broken-down subjects. It is rapid and destructive in its progress, often eroding the cartilages of the larynx. It requires active local as well as general treatment. The margin of this form of ulceration is sharply cut, and there is no surrounding thickening of the tissues. The serpiginous form, on the other hand, most commonly occurs, when it does present itself (which is rarely), in strong, healthy individuals. It is much slower in its progress, and carries before it an effusion of specific lymph, its edges thickened, irregular, and of lupoid character. It is in the phagedænic that large doses of iodide of potassium and iron, combined with opium and a liberal diet, will prove most serviceable. In the serpiginous form of ulceration the best results are to be obtained, he believes, from the judicious administration of a carefully-sustained course of mercury.

In regard to the pathology of the laryngeal spasm, he regards it as being caused, in the phagedænic variety of ulceration, by exposure of the recurrent laryngeal nerve; whereas, in the serpiginous, it is probably the result of pressure upon that nerve, or of pressure and ulceration combined, as sometimes happens in cases of malignant disease.

(Papers quoted from in the above article: Bryant, "Clinical Society Transactions," London, 1868. Hilton, "Course of Lectures on the Influence of Mechanical and Physical Rest in the Treatment of Accidents and Surgical Diseases.)

CONTRIBUTED BY DRs. GEORGE R. CUTTER, EDWARD FRANKEL, AND W. T. BULL.

SURGERY.

Accident in Tracheotomy.—At a meeting of the Société de Chirurgie, M. de St. Germain narrated the following case: A child of four years, with a short and fat neck, was subjected to tracheotomy for croup. After

firmly fixing the head, the incision was made and the dilator introduced. The entrance of the canula was prevented by some obstacle, and M. de St. Germain enlarged the tracheal wound. After further efforts, lasting fifteen minutes, the tube was in place, and the child breathed well. Death ensued four days later. The autopsy showed that the posterior wall of the trachea was incised as well as the anterior, and that the wound had been enlarged in enlarging the first incision. M. de St. Germain believes that the accident would have been prevented if he had limited the introduction of the bistoury to one centimetre and a half. This was his ninety-seventh operation. None of the others had been attended by serious accident.—*Gazette Hebdom.* W. T. B.

Luxation of the Xiphoid Cartilage.—M. Polaillon recently reported to the Société de Chirurgie a case of this accident, remarkable from its mode of production: A female of thirty years entered the hospital last November. Being pregnant, she had concealed her condition by wearing a very tight corset, which she was obliged to discard at the seventh month, because a small, very painful tumor appeared in the epigastrium, in the median line, immediately under the sternum. This remained till the end of pregnancy, and she was delivered on November 5th, with forceps. When P. saw the patient after confinement, he found a small, very hard tumor under the inferior extremity of the sternum, very projecting, and movable forward, but not backward. He concluded that there was a luxation of the ensiform appendage. This remained permanent, but no more pain was complained of. Malgaigne cites only two examples of this luxation, and those were caused by traumatism. In the above case neither blow nor fall had been sustained, and the only cause traceable was the constriction of the base of the thorax by wearing the corset too tight.—*Gaz. Méd. de Paris*, No. 3, 77. E. F.

On Phimosi Symptomatic of Diabetes Mellitus.—Under this title the *Lyon Médical*, No. 25, 1876, contains a paper by Dr. Niepee, Jr., in which attention is specially directed to the occurrence of redness, pruritus, etc., around the meatus, on the glans, etc., in patients affected with diabetes mellitus. In 1859, Gubler, in his article "Ascenscence," in the *Dict. Encyclop.*, first described the pathogeny of these symptoms; and in 1864 Friedreich published a note in Virchow's *Archiv* on the fungi which are found in diabetic patients on the glans, scrotum, and vulva. Balano-posthitis is a valuable diagnostic sign in diabetes, and it is singular that its value should so long have remained unrecognized. The spores of penicillium glaucum are found around the corona glandis and on each side of the frenum, and give rise to intolerable itching. Friedreich states that in cases where the quantity of glucose is too small to show unequivocal reaction with copper and potash, the presence of these spores is sufficient to establish a diagnosis of saccharine urine. A case is reported by the author, that of a gentleman under treatment for syphilis, and who was taking the sulphur and saline baths at Uriage; during one of these baths sudden tumefaction of the penis and phimosis took place. The patient had previously been able to withdraw the prepuce; was of very cleanly habits; there was no herpes or other parasitic lesion or chancre. The symptoms continued with severity for several weeks, when the patient submitted to circumcision. The patient's urine was subsequently examined, and was found to contain sugar. The author explains the suddenness of the symptoms by the sudden stimulating influence of the baths, producing an aggravation of the inflammation primarily caused by the presence of these spores under the prepuce. The author concludes: 1. "When a patient is known to be diabetic, and the condition of the genitals seems predisposed to inflammation, it is necessary to prevent the collection of urine under the prepuce by alkaline injections and cleanliness; if the phimosis has

already taken place, active antiphlogistic measures should be adopted; injections of carbolic acid (200) and alkaline baths should be prescribed; and, lastly, *débridement*, or even circumcision, performed. The only objection to surgical interference is the occurrence of gangrene, which is so apt to supervene in diabetic patients after operations; but this complication is not constant. The dread of gangrene, therefore, should not deter the surgeon when the phimosi is very acute. 2. When phimosi appears suddenly and spontaneously in an individual not suspected of having diabetes, the urine should be analyzed, and the secretion furnished by the parasitic balanoposthitis should be examined under the microscope. This will confirm the diagnosis of diabetes, of which disease phimosi is sometimes the only apparent symptom." E. F.

On the Use of Arsenic in Tumors of the Lymphatic Glands.—The observations and experience of Dr. A. Winewarter (*Medizinische Jahrbücher der k. k. Gesellschaft der Ärzte*, 1877, ii., p. 153) justify the following conclusions:

I. The treatment of both malignant lymphomata and leukæmia by means of arsenic is efficacious, since it induces a resorption of the hyperplastic glandular tissue.

II. Arsenic owes its favorable influence to its inherent power of inducing a process of decomposition in albuminous tissues, and especially glandular tumors, which makes resorption possible.

III. Moreover, the local effect of injection and the arsenical fever contribute to the diminution of the size of the tumors. Cures accomplished by arsenic may last for a year; and the recurring tumors are as susceptible to treatment as the primary. In malignant lymphomata the treatment by means of arsenic is unquestionably more efficacious than operation. Operative measures are to be accompanied by internal treatment in every case. W. T. B.

Pathology of Ranula, *Arch. für klin. Chir.*, xx., 4, p. 825, 1877.—Neumann had an opportunity of examining a portion of the cyst-wall of a ranula which was excised by Prof. Schönborn. The cyst had existed from birth in the person of a laborer of fifty-two years of age. It had taken on an active growth only within a few years, and had reached such a size as to fill up the anterior portion of the mouth, and to force the tongue against the pharyngeal wall, causing much trouble in speaking and swallowing.

The membrane lining the interior of the cyst was coated by the mucous membrane of the mouth externally, and separated by a loose connective tissue, containing striated mucous fibres. The striking fact was that the cyst-wall consisted of a basement membrane (with some elastic fibres), and covered with a cylindrical ciliated epithelium.

In regard to the presence of ciliated epithelium, Neumann considers this cyst due to a dilatation of the lumen of the foramen cæcum of the tongue, which was found by Bochdalek (*Oesterreich. Zeitschrift für prakt. Med.*, Nos. 36, 37, 42 to 45, 1866, and Reichert's and Du Bois's *Archiv*, p. 775, 1867) in twelve out of fifty cases not consisting of a blind duct, but in a duct of 10''' to 15''' length, passing in the direction of the middle glosso-epiglottic ligament, and giving off from its posterior third one or more branches, which, passing downward toward the floor of the mouth, are concealed in the posterior fibres of the genio-hyoglossus muscle, and end in convolutions, provided with cylindrical ciliated epithelium.

The correspondence of the character of the epithelium and that of the contents of the cyst with that found in the normal structure, together with the identity of situation and its existence from birth, support the view of Neumann, that in this case the cyst came from the dilated puncture of the foramen cæcum. W. T. B.

THEORY AND PRACTICE.

On the Relations of Sciatica to Diabetes.—Rosenstein, after relating cases of sciatica limited to the peroneal and tibial nerves, and complicated with mellituria, inquires into which of the two affections is the primary one. Clinical observation and experimentation (section of the sciatic nerve) have led Rosenstein to the assumption that these two morbid phenomena are both the effect of a venous hyperamia of the abdominal organs. Appropriate treatment directed against the latter puts an end to the neuralgia and mellituria; while the customary treatment of sciatica is inefficacious in cases complicated with mellituria. According to Rosenstein, the prognosis is favorable. He recommends that the urine should always be examined for sugar in cases of rebellious sciatica, limited to the peripheral portions of the nerve.—*D. Med. Wchschr.*, 51, 176; *Gaz. Méd.*, 3, 77. E. F.

Rare Form of Disease of the Spinal Medulla.—Perfectly healthy parents had seven children, three of whom were healthy, while four were attacked by a similar and very peculiar disease. The essential symptoms of this affection were a primitive motory weakness, which became gradually developed, and was subsequently followed by an extensive atrophy attacking the muscles equally, a permanent contraction of the atrophied and paralyzed members, which were painful to pressure, and an extension of the symptoms of paralysis to the nerves which arise from the bulb of the medulla. The primary existence of the paralysis, which was followed by atrophy; the equability of the latter, which did not attack isolated muscles here and there, as in progressive muscular atrophy; the contractions—all these are against the opinion of progressive muscular atrophy. The morbid picture agrees rather with the form first determined by Charcot, which Dr. Seeligmüller called lateral hemiatrophic sclerosis. According to the latter, the seat of the disease is originally in the lateral cords of the medulla; later, the process attacks the anterior columns and the bulb. The mothers of both the parents were sisters. The early age at which the disease occurred is also interesting. The largest boys were ten and eight years of age, the third was not quite seven, and the girl sixteen months old.—*Il Movimento and Gazz. Med. Ital. Venete*, December, 1876. G. R. C.

Miscellany.

American Gynecological Society.—The second annual meeting of this flourishing Society was held in Boston, May 30th, 31st, and June 1st. The attendance was large, and a number of valuable papers were read. The proceedings, judging from the condensed report which appears in the *Boston Medical and Surgical Journal*, were characterized by the extremely diverse views of members on the principal subjects of discussion. This was the case in regard to amputation of the cervix uteri, on which Dr. Byrne, of Brooklyn, read a paper; the danger of administering chloroform during labor,

the subject of Dr. Lusk's paper; the intra-uterine treatment of flexions, as recommended by Dr. Vandewarker, of Syracuse; flexions in general, their pathology and treatment; so-called "normal ovariectomy," as practised by Dr. Batty; and, finally, the differential diagnosis of sarcoma and carcinoma uteri. The most important original paper was that of Dr. Dalton, on the relations between the corpus luteum of menstruation and that of pregnancy. The address of the President of the Association, Dr. Fordyce Barker, was rather depreciatory of operative procedures generally in diseases of women; the mechanical treatment of displacements was referred to as of questionable utility in many cases, and the hope was expressed that much would be accomplished by medicines yet to be discovered. Dr. Peaslee was elected President, Dr. Chadwick, Secretary, and Dr. Mundé, Treasurer, for the ensuing year. The Society adjourned to meet in Philadelphia in the second week in September, 1878.

The American Medical Association.—The twenty-eighth annual meeting of this Association was held in Chicago, June 5th to 8th. The Society was called to order by Dr. Sims, the retiring president, who introduced his successor, Dr. H. I. Bowditch. We regret that want of space prevents us, in the present issue, from giving even a synopsis of the highly interesting proceedings. The following officers were elected: President: Dr. T. G. Richardson, of Louisiana. Vice-Presidents: Dr. J. P. White, of New York; Dr. M. Gunn, of Illinois; Dr. G. W. Russell, of Connecticut; Dr. A. Dunlap, of Ohio. Chairman of the Section of Medicine, Materia Medica, and Physiology, Dr. A. L. Loomis, of New York; Secretary, Dr. J. H. Etheridge, of Illinois. Chairman of Section of Obstetrics and Diseases of Women and Children, Dr. E. W. Jencks, of Michigan; Secretary, Dr. H. A. Marcy, of Massachusetts. Chairman of Section of Surgery and Anatomy, Dr. H. H. Smith, of Pennsylvania; Secretary, Dr. E. Z. Early, of Arkansas. Chairman of Section on Medical Jurisprudence, Chemistry, and Psychology, Dr. W. Kempster, of Wisconsin; Secretary, Dr. E. A. Hildreth, of West Virginia. Chairman of Section of State Medical and Public Hy-

giene, Dr. J. L. Cabell, of Virginia; Secretary, Dr. E. J. Marsh, of New York. The Association adjourned, to meet in Buffalo, N. Y., at 9.30 A. M., Friday, June 8, 1877.

Death under Ether.—The *Medical Times and Gazette* of May 19th reports the death of a man aged sixty-nine, in the London Hospital, May 12th, during the administration of ether. It is stated that "for about thirty seconds he inspired only his expired air." A small quantity of ether was then given, and the pulse and respiration ceased. The *post mortem* showed a coil of small intestine entangled in a loop of mesentery, and peritonitis. The man seemed to have died rather of shock than ether, and the verdict of the jury was, "Death from natural causes." We should think the poisoning by carbonic acid gas an unfavorable preliminary to the use of ether in an old and feeble patient suffering from peritonitis, and do not understand why he was allowed to inspire his own expired air.

Dialyzed Iron.—This peculiar preparation, known also as Bravais's iron, has been in use for some time in Europe, but, owing to difficulties attending its manufacture, has not become generally known in this country. It is a neutral and tasteless solution of the peroxide of iron, obtained by endosmosis, and appears to possess decided advantages over other forms of iron, where it is desirable to avoid its styptic and astringent qualities. Messrs. Wyeth & Co., of Philadelphia, have undertaken the manufacture of the dialyzed iron on a large scale, and it will doubtless soon receive the attention it seems to merit.

House of Relief of the New York Hospital.—From the report of the governors of the New York Hospital for 1876, we learn that the above reception hospital (160 Chambers Street) has treated in its wards, during the past year, five hundred and six patients, of whom one hundred and eighteen were medical and three hundred and eighty-eight surgical. Forty-one surgical operations were performed, and five thousand four hundred and fifty-five patients were treated in the dispensary. The number of ambulance-calls was nine hundred and sev-

enty-eight. Three hundred and six patients were transferred to other hospitals.

Appointments, Honors, etc.—It is rumored that the vacant position of Surgeon to her Majesty in Scotland, held by Prof. Lister, will be given to Dr. George Macleod, Professor of Surgery in the University of Glasgow. Mr. Brodie's bronze statue of the late Sir James Y. Simpson was unveiled in Edinburgh May 26th, and is spoken of very highly as a work of art. M. Paquelin has been awarded the Montyon prize by the French Academy for his invention of the thermo-cautery. Dr. Peacock has resigned the office of Physician at St. Thomas's Hospital, and will probably be succeeded by Dr. Ord.

American Dermatological Association.—The first annual meeting of the American Dermatological Association will be held at Niagara Falls on the 4th day of September next. According to the by-laws, the titles of all papers to be read at any annual session shall be forwarded to the Secretary not later than one month before the first day of the session. The following are the officers of the Society: President, James C. White, M. D.; Vice-Presidents, Louis A. Duhring, M. D., and Robert W. Taylor, M. D.; Secretary, L. Duncan Bulkley, M. D.; Treasurer, James Nevins Hyde, M. D.

California State Medical Society.—The annual meeting was held in San Francisco, April 18th. Dr. Washington Ayer, of that city, was elected President for the ensuing year, and Dr. G. G. Tyrrell, of Sacramento, Permanent Secretary. There was some rather heated discussion in regard to the expulsion of certain members, and the recognition of other gentlemen proposed for membership; but, from the list of papers presented and referred to, the Society would appear to be in a flourishing condition. An excess of zeal in regard to the qualifications of members is better than apathy or indifference.

Rockland County (N. Y.) Medical Society.—At the annual meeting of this Society, held May 29th, the following officers were elected for the ensuing year: President, Dr. J. J. Stephens, of Tappan; Vice-President, Dr. I. C. Haring, of

Clarkstown; Secretary, Dr. William Govan, of Stony Point; Treasurer and Librarian, Dr. J. S. Wigton, of Spring Valley; Censors, Drs. J. O. Polhamus, E. H. Maynard, and I. C. Haring; Delegate to American Medical Association for 1878, Dr. William Govan.

Capillary Drainage in Anasarca.—Dr. Southey described to the Clinical Society of London, at their meeting, April 27th, his method of drainage in general anasarca. He uses silver canulæ about the size of hypodermic needles, and attaches to them, after introduction, a capillary rubber tube conducted into a pan beneath the bed. A surprising amount of serous fluid, he had found, could be withdrawn from a single tube in each leg. The method is cleanly, and free from discomfort to the patient.

International Medical Congress.—The fifth session of this body will be held this year, 9th to 15th of September, in Geneva. Prof. C. Vogt is President of the Committee of Organization. The work of the congress will be divided into six sections, as follows: Section I., Medicine; Section II., Surgery; Section III., Midwifery and Gynecology; Section IV., State Medicine; Section V., Biology; Section VI., Ophthalmology and Otology.

A New Danger in Transfusion.—Further investigation of the case of death which occurred recently in Liverpool, of a man who had furnished four ounces of blood for transfusion, discovers the facts that the man received a sovereign for his blood, and immediately went and "got blazing drunk." Erysipelas supervened, and the man died. The death was evidently an avoidable accident, and does not in any way affect the merits of transfusion.

Illinois State Medical Society.—The annual meeting was held in Chicago, May 15th to 17th. A number of able papers were read, and the discussions were of unusual interest. The following officers were elected for the ensuing year: President, J. L. White, of Bloomington; First Vice-President, E.

P. Cook, Mendota; Second Vice-President, B. M. Griffith, Springfield; Treasurer, John H. Hollister, Chicago; Assistant Secretary, H. B. Buck, Springfield.

Vaccination Statistics.—The *Sanitary Record* points with satisfaction to the fact that, since vaccination became compulsory in England and Wales, in 1853, the average mortality from small-pox has been less than half what it was during the whole period of civil registration which preceded the passage of the compulsory act.

Professor Lister.—This distinguished teacher has at last yielded to the solicitations of King's College, London, a chair of Clinical Surgery having been created for him, and thirty beds placed at his disposal. The chair of Systematic Surgery, originally offered to Prof. Lister, and which he refused, is still vacant.

Portraits of Eminent Physicians.—A series of excellent photographs of distinguished medical men of Europe has been published by R. Berendsohn, 48 Nassau Street. They are chiefly taken from oil paintings by artists of celebrity. Those of John Hunter, Sir Astley Cooper, and Richard Bright are particularly good.

A Committee on Pyæmia.—The London Pathological Society has received a grant of £350, to be expended in investigating the subject of pyæmia. To this end a committee has been appointed, which will proceed at once to the work of investigation in the most thorough manner possible.

Journalistic Notes.—The *Toledo Medical and Surgical Journal* has passed into the control of the Toledo Medical Press Association, the names of Drs. Jonathan Priest, W. C. Chapman, and Thomas Waddel appearing as editors.

Death from Chloroform.—The *Lancet* of June 9th records the death from chloroform of a patient in the Blackburn Infirmary. There was nothing unusual in the mode of administration. The *post-mortem* appearances were those of asphyxia.

Compliments to an American Surgeon.—The *Lancet* of June 2d alludes in complimentary terms to Dr. James R. Wood's eighth operation of ligating the external iliac, and has also the following reference to his periosteal operations in times past :

"We have been favored with a look at the 'new lower jaw-bone' alluded to in our report of the Congress of German Surgeons at Berlin, and which we believe to be, if not a unique specimen, at any rate the first specimen of the sort seen in Europe. We allude to it with the more pleasure as the operator, Dr. James R. Wood, Emeritus Professor of Surgery in the Bellevue Hospital Medical College, is entitled to the great praise of having been one of the pioneers of periosteal surgery, which constitutes such a creditable and instructive chapter in the recent history of surgery. This particular operation was performed more than twenty years ago ; and the merit of it consists not only in its having been then a new kind of operation, but in the details of the procedure, which had been thought out for the first time, and which have since become recognized principles.

"It is a great feat of what we are disposed to call physiological surgery to take away a whole bone, and to do it so carefully and with such preservation of the periosteum as to have it entirely reproduced in perfect symmetry and perfectly *in situ*. The new jaw is smaller than the original one, but in other respects, in form and position, it is a wonderfully perfect reproduction. The patient was a girl eighteen years of age, working in a match-factory ; hence the phosphorous disease of the jaw, leading to necrosis and the necessity for removal. The operation was done by halves, one half being left for weeks after the removal of the other, so as to steady the parts and determine the proper position of the new jaw, which would otherwise have been dragged down by muscles and cause great deformity. The patient perfectly recovered, and lived three years after. She then died of brain abscess, when the entire skull came into the possession of Dr. Wood. Both he and other operators have frequently repeated these operations with similar success. But the patients are mostly alive, and, as Langenbeck lately said at Berlin, there is not another such specimen in the whole of Europe as the one we now notice."

McGill University, Montreal.—The following changes have been made in the curriculum of the Faculty of Medicine :

1. A practical examination in anatomy will form part of the primary examination.

2. Medical and surgical anatomy will form part of the practical examination by the clinical professors.

3. The attendance upon the lectures on hygiene is compulsory.

4. Students may present themselves for examination in materia medica at the end of the second year.

5. The section in Clause 9 of the Qualifications for the Degree in Medicine, relating to the thesis or inaugural dissertation, is cancelled.

6. Eighteen months' hospital attendance is required, instead of twelve.

7. A certificate of having compounded medicines for six months is necessary to qualify for the degree.—*Canada Medical and Surgical Journal*.

Army Intelligence.

Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from May 14 to June 13, 1877.

SUMMERS, JOHN E., Surgeon and Medical Director.—Granted leave of absence for one month. S. O. 76, Department of the Platte, June 9, 1877.

PAGE, CHARLES, Surgeon.—To perform the duties of Medical Director of the department during absence of Surgeon Summers. S. O. 76, C. S., Department of the Platte.

ALEXANDER, C. T., Surgeon.—Assigned to temporary duty at these headquarters, and to accompany the department commander during existing field operations. S. O. 62, Department of the Columbia, May 29, 1877.

BAILY, J. C., Surgeon.—Assigned to duty in Department of California. S. O. 106, A. G. O., May 18, 1877.

GRAY, C. C., Surgeon.—To report in person to the commanding general Department of the Missouri, for assignment to duty. S. O. 119, A. G. O., June 4, 1877.

GREENLEAF, C. R., Surgeon.—Assigned to duty as Post-Surgeon at Thomas Barracks, Huntsville, Ala. S. O. 85, Department of the Gulf, May 25, 1877.

MIDDLETON, J. V. D., Surgeon.—Relieved from duty in Department of Dakota, and assigned to duty in Division of the Atlantic. S. O. 106, C. S., A. G. O.

WOODHULL, A. A., Surgeon.—Assigned to duty at Alcatraz Island, California. S. O. 50, Division of the Pacific and Department of California, May 14, 1877.

KINSMAN, J. H., Assistant Surgeon.—Relieved from duty in Depart-

ment of Dakota, and ordered to Department of the Gulf. S. O. 106, C. S., A. G. O.

BENTLEY, E., Assistant Surgeon.—Assigned to duty at Little Rock Barracks, Ark. S. O. 76, Department of the Gulf, May 14, 1877.

HEIZMANN, C. L., Assistant Surgeon.—Assigned to duty at Fort Niagara, N. Y. S. O. 109, Division of the Atlantic, May 19, 1877.

DE WITT, C., Assistant Surgeon.—On expiration of his present leave of absence, to report to the commanding general Department of the Platte, for assignment to duty. S. O. 106, C. S., A. G. O.

MOFFATT, P., Assistant Surgeon.—Assigned to temporary duty at Fort Hamilton, N. Y. H. S. O. 112, Division of the Atlantic, May 23, 1877.

WOODRUFF, E., Assistant Surgeon.—Assigned to duty at Fort Davis, Texas. S. O. 88, Department of Texas, May 15, 1877.

KING, WILLIAM H., Assistant Surgeon.—Assigned to duty at Fort Sully, D. T. S. O. 65, Department of Dakota, May 26, 1877.

COWDREY, S. G., Assistant Surgeon.—Assigned to duty at Mt. Vernon Barracks, Ala. S. O. 80, C. S., Department of the Gulf.

DICKSON, J. M., Assistant Surgeon.—Assigned to duty as Post-Surgeon, Jackson Barracks, La. S. O. 82, Department of the Gulf, May 22, 1877.

PAULDING, H. O., Assistant Surgeon.—Relieved from field-duty, and to resume his duties as Post-Surgeon, Fort Ellis, M. T. S. O. 71, Department of Dakota, June 5, 1877.

MAUS, L. M., Assistant Surgeon.—Relieved from duty in Department of the South, and ordered to Department of Dakota. S. O. 106, C. S., A. G. O.

PRICE, C. E., Assistant Surgeon.—Assigned to duty at Camp Gaston, Cal. S. O. 50, C. S., Division of the Pacific and Department of California.

HALL, W. R., Assistant Surgeon.—To accompany the troops withdrawn from Alaska, and, upon arrival at Fort Stevens, Oregon, report to the post-commander for duty as Post-Surgeon. G. O. 13, Department of the Columbia, May 23, 1877.

BARNETT, R., Assistant Surgeon.—Assigned to duty with Battalion Thirteenth Infantry, under command of Captain Clift. S. O. 80, C. S., Department of the Gulf.

TORNEY, G. H., Assistant Surgeon.—To accompany Battalion Sixteenth Infantry from New Orleans, La., to Leavenworth, Kansas, to remain on duty with regiment, and await orders from A. G. O. relieving him from duty in Department of the Gulf. S. O. 97, Department of the Gulf, June 7, 1877.

CRAMPTON, L. W., Assistant Surgeon.—Assigned to duty as Post-Surgeon, Holly Springs, Miss. S. O. 87, C. S., Department of the Gulf.

TAYLOR, M. E., Assistant Surgeon.—To resume his duties as Post-Surgeon, Baton Rouge Barracks, La. S. O. 82, C. S., Department of the Gulf.

CORBUSIER, W. H., Assistant-Surgeon.—Assigned to duty at Chattanooga, Tenn. S. O. 111, Department of the South, June 5, 1877.

SHUFFELDT, R. W., Assistant Surgeon.—To proceed at once to Fort D. A. Russell, Wy. T., for duty with companies of Fifth Cavalry, detailed for field-service near Cantonment Reno, Wy. T. S. O. 65, Department of the Platte, May 22, 1877.

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Original Communications.

ART. I.—*Sycosis*.¹ By ANDREW R. ROBINSON, M. B., L. R. C. P. and S., Edinburgh, Special Pathologist to the New York City Asylum for the Insane, etc.

Syn.: *Sycosis barbæ* (Celsus): *mentagra* (Plenck): *dartre pustuleuse mentagre*, *herpes pustulosus mentagra* (Alibert): *folliculitis barbæ* (Köbner): *acne mentagra*: *lichen menti*.

Definition.—*Sycosis* is a non-contagious inflammatory disease of the skin, characterized by its chronic course; its limitation to the hairy parts of the body, appearing chiefly on the bearded part of the face; its appearing in the form of papules, tubercles, or pustules, and the invariable perforation of those by a hair.

History.—The name *sycosis* appears frequently in the works of writers during the ancient and middle periods; but though they had certainly seen cases of our *sycosis*, yet their description of the disease designated by them with that term bears so little analogy to the symptoms of our *sycosis*, that they undoubtedly included different diseases under this term. The name *sycosis* first appears in the works of Celsus, Paul of Ægina, and Aëtius.

¹ Prize essay of the Alumni Association, Bellevue Hospital Medical College, New York, 1877.

Celsus (lib. vi., cap. iii.) describes it as an "ulcus quod a fici similitudine *σύνκωσις* Græcis nominatur, quia caro in eo excrescit." The later Greeks, however (Aëtius, Paul), applied the terms *συκα* and *ογκοι σύνκωδεις* to eruptions seated on the eyelids, as well as to the sycosis of Celsus. Celsus said it appears principally on those parts of the skin covered with hairs, and especially on the bearded part of the face ("maxime in barba"); but his description corresponds so little with the characters of our sycosis, that it is unlikely he was acquainted with the latter as a distinct disease. He distinguished two varieties of the disease: the one consisting of hard or round, and the other of moist and unequal ulcers with foetid secretion: "Sub es vero duæ sunt species. Altera ulcus durum et rotundum est; altera humidum et inequale. Ex duro exiguum quiddam et glutinosum exit: ex humido pus, et mali odoris. Fit utrumque in iis partibus quæ pilis conteguntur; sed id quod callosum et rotundum est maxime in barba: id vero, quod humidum, præcipue in capillo."

Paul of Ægina (lib. iii., cap. iii.) described it as an eruption of "round, red, somewhat hard, painful, and ulcerating tubercles of the face; and Aëtius (Tetrab. ii., serm. iv., cap. 14) mentioned it as a skin-affection, differing from acne in its greater tendency to ulceration, and in the nature of the secretion.

Plinius ("Nat. Hist.," lib. xxvi., cap. i.) described under the term "mentagra," instead of lichen, as previously used by the Greeks, a contagious disease which was brought from Asia to Italy in the reign of Tiberius Claudius by a Perusian knight, Quæstoribus Scriba, and which spread especially in Rome and its surroundings, and also, though in a less degree, in other parts of Italy, Illyria, Gaul, and Spain. According to Plinius (lib. xii., Epigr. 59; lib. xi., Epigr. 98 ad Basium, de importunis basiatoribus), it appeared especially among the rich, and owed its spread to certain social customs then prevalent. "Causing little pain, and without danger to life, it produced such hideous deformities, that death would have been preferable. With many of the subjects it did not remain confined to the chin, but occupied the entire face except the eyes, spread to the neck, breast, and hands, which it covered with

hideous scales. Females were not attacked by the disease. The treatment employed was so severe, that it produced cicatrices of even greater deformity than those naturally resulting from the disease."

From this description of the nature and the results of the disease, it is clear that the mentagra of Plinius was a very different disease from our sycosis, and that it was probably of a venereal nature. It is further evident that some forms of syphilis were frequently included in the description of sycosis by those ancient writers, since they speak of the latter as appearing on the anus ("nascitur in ano"); and from the considerable resemblance of some condylomata to the pulp of a fig, it is probable that the disease referred to by them as occurring in that locality was syphilis, and probably a broad condyloma.

Galen ("De Comp. Med.," lib. v.), in speaking of acne, described fig-like tumors ("de ficosis tumoribus") and other eruptions located on the skin ("de lichenosis in mento tumoribus" and "de menti tumoribus"); his description, however, is so incomplete, that, with the exception of the localization on the chin, it could be applied to almost any disease of the skin (Hebra).

From the physicians of the Arabian school, and from those of the middle ages, we have no clear description of sycosis, it being confounded with other diseases, and especially with syphilis. Even such physicians of the seventeenth and eighteenth centuries as Mercurialis ("De Morb. Curand.," Venetiis, 1601), Lorry ("Tract. de Morbis Cutaneis," Parisiis, 1777), and Sauvages ("Nosol. Meth."), contributed nothing to the subject.

Plenck ("Doctrina de Morbis Cutaneis," Viennæ, 1783) put mentagra in the class crustæ, and said: "Est peculiaris scabies circa mentum in crustas abit." He recognized four varieties: *M. venerea*, *leprosa*, *infantum*, and *Plinii*, but, from his description of the different varieties, none of them corresponded to our sycosis.

Bateman was the first writer to give us certain correct ideas of our sycosis; and the majority of authors since his time have followed him, and have applied the term to designate that disease for which Bateman, and also the writers of the

present day, use the term, and whose characteristic nature I have already given you in the definition of the disease. The views of those different authors, including those of Bateman, will be given in that part of my essay devoted to a discussion of the etiology and nature of the disease. That disease, which since the time of Gruby has been called *sycosis parasitaria*, will be discussed in the part devoted to the differential diagnosis of the disease.

Symptoms.—*Sycosis* appears only on those parts of the body which are supplied with hair, and is almost always confined to the bearded part of the face; hence the name *sycosis menti*. Sometimes the eruption is confined to the upper lip, at other times to the side of the chin, or a part only of the submaxillary region. It has been observed on other parts of the body as well as on the face, though its appearance elsewhere is rare. The parts most frequently attacked after the bearded part of the face are the eyebrows, then the scalp, and, lastly, the other hairy parts of the body, especially the axillæ and pubis. I have seen but two cases of *sycosis* of the scalp, in both of which the affection was also present on the face. In one of the cases *eczema* of the scalp preceded and accompanied the *sycosis*; in the other, the *sycosis* invaded the scalp by extension *ex contiguo* from the beard. This latter patient had an exceedingly severe attack of the disease, producing destruction of tissue, and leaving cicatrices as extensive as in many cases of *lupus*. Except in such cases as this latter, in which the disease spreads *ex contiguo* from the bearded part of the face, *sycosis* of the scalp will be found almost always preceded by a greater or less degree of some form of inflammation of this region, and generally by an *eczema*. Even when seated on the face, in the majority of cases, it has been preceded by a chronic moist or dry *eczema*. An *eczema*, however, does not precede or accompany the eruption in every case; sometimes only a chronic hyperæmia is present, and in a third class of cases there is nothing abnormal to be noticed in the skin previous to the outbreak of the eruption, although an irritable condition of the tissues, insufficient to produce inflammatory changes in the part, is present. This last statement will be defended when I discuss, later on,

the cause of the disease. When it appears primarily on the upper lip, it is usually preceded by a nasal catarrh, the discharge from the nose irritating the skin, and producing a congestion or an eczema, which, in its turn, is followed or accompanied by sycosis. Sycosis, situated in this region, mostly remains limited in area, and rarely extends to the cheeks. Nasal catarrh—a disease which differs from eczema only in having its seat on a mucous membrane instead of a cutaneous surface—has naturally the same effect on the tissues under the inflamed mucous membrane; consequently, sycosis is frequently combined with the nasal catarrh in those parts of the nasal mucous membrane provided with hair. Sycosis of this region differs from that of the beard only in the duration of the disease, sycosis in the nose disappearing upon cessation of the catarrh; or, in other words, the disease in that region is generally acute, disappearing upon subsidence of the catarrh, as, afterwards, there is not sufficient irritation to produce the disease; while sycosis of the beard is a chronic affection, continuing generally, unless properly treated, months, or even years.

Sycosis of the beard is generally ushered in with severe local symptoms. It is preceded or accompanied by a feeling of heat, smarting, and a painful, pricking sensation, with swelling or intumescence of the part. Sometimes the attack is so severe, and the local inflammation so great, as to produce swelling of the lymphatic glands in the neck. The eruption makes its appearance in the form of papules and tubercles of greater or less size, ranging from that of a millet-seed to that of a pea, which are isolated or collected in groups. In acute cases, and with the first outbreak of the eruption, the tubercles are generally seated near each other; but in chronic cases the local symptoms are not so severe, and the papules and tubercles are oftener isolated and fewer in number. In subsequent outbreaks new papules and tubercles appear, and, if seated in the same locality, may unite with the former ones and form connected infiltrations. This occurs only where the eruption is seated on parts thickly studded with hairs, and a considerable number of the follicles are affected by the inflammation. The eruption from a single

outbreak rarely appears over a large surface, but generally in patches of limited extent ; the patches in subsequent attacks often occupying a different portion of the face from that during the preceding outbreak. The papules and tubercles are of a red color, somewhat conical in shape when isolated, and generally, though not always, raised above the level of the skin. These papules and tubercles increase in size, pus collects on the summit, and afterward the greater part of the papule is gradually converted into a pustule. The length of time occupied in the transformation from papule or tubercle to pustule differs in different individuals, in the different outbreaks of the eruption on the same individual, and in the different papules and tubercles which make up a single patch. For instance, in scrofulous individuals the pus formation proceeds slower than in robust individuals, though it is more abundant ; in chronic cases the papules change slower than in acute attacks ; and lastly, pus collects usually more rapidly in the perifollicular region of stiff hairs than in that of fine ones. Thus it happens that, when a patient presents himself for consultation, papules, tubercles, and pustules are found present in varying proportions on the affected part ; and if the eruption has already lasted several days, the majority will consist of pustules. Each papule, tubercle, and pustule, whether raised above the level of the skin or not, is perforated through its centre by a hair. The perforation of the tubercles, papules, and pustules, through the centre by a hair is characteristic of the disease, and it is upon the presence or absence of this perforation that the greatest reliance is to be made in forming a diagnosis between sycosis and the other diseases liable to be confounded with it. If perforation is not present, then the disease is not sycosis. This affords a ready explanation why sycosis is confined to the hairy parts of the body, as perforation of the papules by hairs is necessary to constitute the disease. When the tubercles and papules have become pustules, which usually occurs in from two to ten days, a scab forms on their summit, if not prevented by shaving or some emollient application, both of which would remove or prevent the formation of any scab that might otherwise form. The scabs in uncomplicated cases are generally thin, slight,

and isolated, differing in this respect from those of impetiginous eczema, which are thick and form a large mass. Upon removal of the scab with the forceps, a circular funnel-shaped excavation is observed, having a hair exactly in the centre, and the base filled with pus. On account of the inflamed and irritable condition of the tissues surrounding it, great pain is caused in the extraction of the hair during the papular stage of the disease; but in that period of the pustular stage when the pus or serum which surrounds the follicle has penetrated the follicle-sheaths and separated the hair from its normal surroundings, or has destroyed those latter, as is generally the case in the pustular stage, no pain arises from extraction of the hairs, as they lie loosely in the follicle. In fact, if not extracted, the ever-increasing accumulation of pus around and within the follicle, and its subsequent movement to the surface through the space previously occupied by the hair-sheaths or the tissue immediately surrounding them, finally expels the hairs, and the part heals, with or without cicatricial tissue. The resulting cicatrices are sometimes flat, and sometimes raised above the level of the skin. If the pus has escaped through the opening of the follicle, the part will probably heal without a cicatrix forming. If, however, we do not extract the hair as soon as this can be done without causing much pain, and thus allow exit to the accumulating pus, there is danger of destruction of the follicle, and consequent permanent alopecia. If the hair remains until it lies loosely within the follicle, there is danger of the inflammatory products destroying the base of the follicle and the seat of origin of the hair. This condition of the hairs is met with only in an advanced period of the pustular stage; for during the papular stage the hairs are unchanged, and sit firmly within the follicle.

The amount of suppuration differs greatly in different subjects. In those of a strumous constitution it is much greater than in robust individuals. Sometimes the amount of suppuration and cell-infiltration in the skin is so great that complete destruction of the cutis, hair-follicles, sebaceous and sweat glands occurs, followed by cicatrices as extensive as in many cases of lupus. Such a destruction of tissue, however,

rarely occurs, and the only evil result generally of even a long-continued chronic sycosis is destruction of the hair-follicle and sebaceous glands, with consequent permanent alopecia. Even this, to any considerable extent, is not a frequent occurrence; yet a limited number of follicles are usually destroyed if the suppuration has been at all extensive and epilation not performed at the proper time. When the papules are isolated, and no eczema is present, the inflammation is limited to the immediate neighborhood of the follicles. The tissue between the pustules is therefore sometimes natural; but, as a rule, there is hyperæmia or a slight dermatitis, with desquamation, especially if the pustules are not too widely separated from each other. In cases of long standing this condition of chronic dermatitis is nearly always present, and increases the irritability of the skin. The area of surface occupied by the eruption at a single outbreak varies greatly. Sometimes it is very limited; at other times, and more especially in acute cases, it can occupy the entire cheek. In chronic cases often only a few isolated pustules make their appearance here and there, unaccompanied by the heat, pain, and swelling which usher in acute attacks. When seated on the upper lip, the eruption is generally limited to a small patch, not larger than a ten-cent piece, situated near the middle line, and nearer the nasal orifices than the mouth. If the patient does not shave, such a patch appears red, somewhat swollen, and covered with a crust. Upon removal of the latter, a few papules or pustules are found, each perforated by a hair, and a slight discharge is usually present. Such a patch is generally a combination of eczema and sycosis, shows but little tendency to spread, and is exceedingly rebellious to treatment, unless the nasal catarrh, from which it usually has its origin, is previously cured.

As I have already said, the papules, tubercles, and pustules are generally isolated; but sometimes they are collected, and accompanied by infiltration in the intervening skin and subcutaneous tissue. This occurs only when the affected part is provided with numerous hairs, or in acute attacks accompanied with considerable local inflammation. When they are thus united by infiltrations, papules or tubercles no longer arise in that region as long as the infiltration exists to any

considerable extent ; but new pustules arise in the infiltrated tissue, and the pus, passing to the surface, becomes dried up, forming brownish or yellowish scabs, perforated with hairs. On removal of these scabs, we find underneath, as in the case of the scabs formed on isolated pustules, circular, funnel-shaped excavations, corresponding in number to that of the follicles, and each excavation is perforated by a hair. This circular, conical excavation, containing pus at its base, and perforated in its centre by a hair, is found in nearly all pustules present in this disease, whether isolated or collected, upon removal of the pus or scab from the surface. If the hair has been extracted in removing the crust—a not unfrequent occurrence, as the hair sits lightly in the follicle in this stage of the disease—then naturally it will not be seen penetrating the excavation. With this exception, however, this perforation by a hair is always present, and should be sought for in every case upon removal of the crusts or scabs, if there is any doubt about the correct diagnosis. Where the beard is allowed to grow, and the natural course of the disease is not interfered with, scales or scabs are always present during the pustular stage ; but if the part is frequently shaven, their formation is prevented, though in other respects the symptoms of the disease remain unchanged. Papules, tubercles, and pustules, will be present as usual, and the perforation by a hair will be much more easily recognized than when scabs are present. When the hairs are finer, isolated papules are present, instead of tubercles and infiltrations. “ Sometimes productions resembling plaques muqueuses arise from the surface of the ulceration in the course of the disease, or the confluence of several deep-seated pustules may produce an abscess resembling an anthrax, having several openings on the surface. In other cases granulations appear on the surface, in the form of the *caro luxurians* ” (Hebra, *l. c.*, p. 610). This statement of Hebra is more appropriate for cases of parasitic disease of the beard than for sycosis, since it is exceedingly rare to see such abscesses, or any granulations bearing any resemblance to the pulp of a fig, in the latter disease, while in the former they are not uncommon. Sometimes the pustular formation, especially in strumous or ill-fed persons, is so

great as to produce scabs similar to those in impetiginous eczema. In chronic sycosis, or, better said, in sycosis of long standing, there is more or less induration and thickening of the affected part, from the products of the constantly-recurring inflammation. We have thus seen that the eruption in sycosis differs in appearance in different subjects, according to the general condition of the patient, whether the hairs are strong or fine, long or closely shaven, and whether the papules, tubercles, and pustules, are isolated or collected.

Sycosis is a chronic disease lasting weeks, months, or even years, and is prolonged by successive outbreaks of the eruption arising before the previous one has disappeared. These successive outbreaks occur generally at intervals of from seven to fourteen days, and the eruption follows the same course as the first outbreak; therefore the description I have already given of the primary outbreak will answer for that of the subsequent attacks. A successive attack does not always appear on the same place as its predecessor, especially in chronic cases, different parts of the face being often the seat of different outbreaks of the eruption. A notable exception to this is the case of sycosis of the upper lip, where, as I have already mentioned, the disease shows no tendency to spread, but remains confined to its original seat for months, and even years. The disease in this region, however, is a combination of eczema and sycosis, the latter having its origin in the inflammation constituting the eczema. The eczema, in its turn, is produced and continued by the irritation arising from the nasal secretion in coryza passing over the affected surface. This nasal secretion irritates only a small portion of the upper lip, and unless some portion of the remainder of the tissue of the bearded part of the face is made irritable by other means, as shaving, cosmetics, heat-rays, etc., the tissue will not be disposed to the production of sycosis, and the eruption will remain limited to the only spot irritated. This affords an explanation why sycosis of the upper lip usually remains confined to the limited area I have already described.

Generally the disease is milder in summer than in winter. If cured, it is very liable to return in a few weeks or months, and especially in autumn. If recovery takes place spontane-

ously, it does so by the cessation of the successive outbreaks by which it was prolonged, and by the gradual healing of the pustules, and growth of new hair from those follicles not destroyed by the suppurative inflammation. There is always complete replacement of the lost hairs by new ones, except where the follicles have been destroyed.

I have given, in the foregoing pages, the natural history of sycosis with its usually long chronic course, sometimes lasting for thirty years, and its spontaneous termination in either complete restitution of the part to its normal condition, or in general or partial alopecia; and sometimes, though rarely, in destruction of the epidermis, cutis, hair-follicles, sebaceous and sweat glands, and substitution of those structures by cicatricial tissue. Divested of its unusual characters, sycosis may therefore be briefly described as follows: It is a chronic disease, confined generally to the bearded part of the face; it makes its appearance in the form of papules or tubercles, which after a few days become pustules, and each papule, tubercle, and pustule is perforated through its centre by a hair. This eruption, after having completed the pustular stage, disappears, and is succeeded by a new eruption similar in all respects to the primary outbreak, and is in its turn succeeded by a similar eruption, and so on, so long as the disease continues to exist. Upon cessation of the disease the part regains its normal character and appearance, except a slight partial alopecia from destruction of a few hair-follicles.

Etiology and Nature.—In giving the history of the disease, I quoted not only the names of the writers previous to the time of Bateman who made use of the term sycosis, but also gave their descriptions and views of the nature of the disease referred to by them under that term. From their descriptions it follows that, if they included our sycosis under that term, they confounded it with other diseases, and especially with syphilis, since their descriptions correspond with no one special disease known to dermatologists of the present day. Since the time of Bateman, however, the majority of authors agree in the use of the term sycosis, as applied to the disease whose symptoms I have already described. I have, therefore, reserved for this part of my essay a statement of

the views of those writers on the nature and cause of the disease, at the expense of leaving the part devoted to the history of sycosis incomplete, since I wished to discuss the correctness of some of them, after giving the results of my own observations, and the views I have formed from them. I will first give the views of those authors, and return to a discussion of them, when stating the conclusions I have formed from my own studies.

Bateman ("A Practical Synopsis of Cutaneous Diseases," 7th ed., London, 1829, p. 403) classed it with *acne*, among the *tuberculæ*, and accepted the two species of Celsus (*Sycosis menti et capilitii*). He believed it is an inflammation of the hair-follicles and sebaceous glands, and that it differs from *acne indurata* in its seat being exclusively on the bearded part of the face; by the softer, more numerous, and clustered tubercles, and by the ulceration which they tend to produce; also from the *porrigo* of Willan, by the nature of the tumors, age of the patient, and absence of contagion.

Alibert ("Précis Théorique et Pratique des Maladies de la Peau," tome i., Paris, 1818, p. 263) was the first who said that sycosis approaches *acne* in its nature, and treats of it under the title, *Dartre pustuleuse mentagre*; also *Herpis pustulosus mentagra*. He classed it with his species *varus*, which included the diseases of the sebaceous glands. He believed that the situation, the apparent similarity of cause, the course of the disease, and the age of the patient, show their close relation. He believed that it is an inflammation of the sebaceous glands and hair-follicles, caused by the use of bad razors, or from suppressed hæmorrhoidal flow. He mentioned, also, that it sometimes spreads to the mucous membrane of the mouth, where no hair-follicles exist!

Cazenave ("Abrégé Pratique des Maladies de la Peau," 4th ed., Paris, 1847, p. 312) put it in the order "*pustulæ*," and denied its contagious nature. Before 1841 he said it follows general inflammation of the skin, but since that time that it is an inflammation of the hair-follicles, and arises from the use of bad razors. He believed it is a pustular disease, and that any papules or tubercles present are secondary to the pustules.

Rayer (*"Traité Théorique et Pratique des Maladies de la Peau,"* tome i., 2d ed., Paris, 1835, p. 661) classed it with the acne eruptions, and said it arises from exposure to high temperature, and from the use of bad razors.

Plumbe (*"A Practical Treatise on the Diseases of the Skin,"* 4th ed., London, 1837, p. 91) said it is nothing more than acné, or follicular obstruction and its consequences, occurring on parts covered with hair, and differs from acne only in the existence of hair on the part, and its consequence in aggravating the disease. He gave a very good description of the disease, and was the first to recommend epilation in the treatment. He believed it to be an inflammation of the hair-follicles and sebaceous glands, and drew attention to the invariable perforation of the papules by a hair.

Bazin (*"Affections Cutanées de Nature Arthrique et Dartreuse,"* 12th ed., Paris, 1868, p. 226) thinks there are five kinds of sycosis, viz.: Artificial, parasitic, syphilitic, arthritic, and scrofulous. He denies the existence of the *microsporon mentagrophyta*, and says the fungus found in the so-called parasitic sycosis is that of *tinea tonsurans*. The syphilitic and scrofulous varieties he regards as cases of pseudo-sycosis, because the inflammation is not limited to the hair-follicles. In true sycosis, he says, the inflammation is limited to the hair-follicle, and does not extend to the subcutaneous tissue. He believes the predisposing cause of cases of true non-parasitic sycosis is either an arthritic or scrofulous condition of system, and the exciting causes anything that irritates the skin, as cosmetics, heat, shaving with dull razors, etc.

Küchenmeister (*"Die in und an dem Körper des lebenden Menschen vorkommenden Parasiten,"* Leipzig, 1855) said all cases of sycosis are parasitic.

Hebra (*"Lehrbuch der Haut-krankheiten,"* Bd. i., zweite Lieferung, zweite Auflage, Erlangen, 1874, p. 605) places sycosis among the acne eruptions, of which he gives three varieties: *Acne disseminata*, *acne mentagra seu sycosis*, and *acne rosacea*. He says it is a local disease of the hair-follicles, the cause of which is unknown. He gives an excellent description of the disease, and always denied the existence of a parasitic sycosis. Last year, however, he saw a "typical case" of

the *sycosis parasitaria* of authors, and it is probable he no longer denies its existence.

Tilbury Fox ("Skin-Diseases," 2d American edition, New York, 1873, p. 502) calls it a parenchymatous inflammation of the hair-follicles, with the ordinary results of long-continued congestion. He says it is an independent morbid state of the actual hair-follicle itself, the cause of which is doubtful, though external irritants, as shaving and long-continued exposure to heat-rays, can produce it in persons "out of health."

Nelligan ("Diseases of the Skin," 4th American edition, Philadelphia, 1864, p. 275) considered all cases of sycosis as parasitic.

Wilson ("Lectures on Dermatology," London, 1871, p. 136) says it is an inflammation of the hair-follicles. There are several varieties of the disease, and among them is observed the phytiform degeneration of the epithelium consequent on deranged development and nutrition of the tissue.

Hutchinson ("London Hospital Reports," vol. iii., 1866, p. 389) denies the existence of a parasitic sycosis.

McCall Anderson ("Eczema," 3d ed., London, 1814, cap. xii.) describes under the term *eczema pilare faciei* appearances which correspond exactly with those of sycosis; yet he says it differs from the latter in being simply an extension of the *eczema* to the perifollicular region, while sycosis consists in small abscesses and tubercles.

Baudet ("Traité des Affections de la Peau," Paris, 1869, p. 94) says it is an inflammation of the hair-follicles depending on an arthritic constitution. He believes that a sycotic eruption, whether arthritic or parasitic, can be converted into a syphilitic or a scrofulous eruption if the patient, while affected with sycosis, becomes syphilitic or scrofulous.

The other French writers, as Chausit, Rayer, Duchenne, Dupare, Gibert, Rochard, Divergie, Giubout, etc., have contributed nothing worthy of special mention.

Wertheim (*Zeitschrift der k. k. Gesellschaft der Aerzte*, 1861) made use of the microscope in studying this disease, but only with the object of confirming previously-conceived ideas of its nature and cause. He argued thus: Since a

hair is always in the centre of every pustule, and pus always follows the extraction of such a hair, therefore the hair-follicle must be the seat of the inflammation. Every such follicle will therefore inclose an abscess with its sheaths, and every pustule is a metamorphosed hair-follicle. As sycosis appears but very rarely on other parts of the body than that of the bearded parts of the face, therefore the cause of the disease must be in the anatomical character of the hair-follicles of this region. Believing in those conjectures, he examined the structure of healthy hair-follicles taken from different parts of the body. From these studies he found that in the beard the hair has a greater diameter, in comparison with the diameter of its sheaths, than in any other part of the body. As the pus reaches the surface by destroying or pushing aside the external and internal root-sheaths, therefore, when the hair-follicle is inflamed, the pus has much more difficulty in reaching the surface when the hair is thick and the sheaths thin, than when the hair is thin and its compressible sheaths thick. On account of the resistance which a thick hair offers to the immediate evacuation of pus, the latter collects, and an abscess is formed.

Köbner ("Klinische und experimentelle Mittheilungen aus der Dermatologie und Syphilidologie," Erlangen, 1864, p. 13) was the first to give any description of the changes which take place in the hair in sycosis. He names the disease folliculitis barbæ, and says it has no connection with acne, but is an idiopathic inflammation of the follicle, which inflammation is the cause of the nutrition changes which take place in the hair. This inflammation may be produced by changes of temperature as well as from chemical and mechanical irritants. He examined hairs extracted in different stages of the eruption, but did not make any microscopical examination of the diseased follicles *in situ* or otherwise. The changes outside the follicle he regards as consecutive to those taking place within it. He says that first the external and then the internal root-sheaths swell, their cells become enlarged, increase in number, divide, and finally are partly transformed into pus and detritus. The hair itself is not changed at first, but later it loses its connection with the follicle, the bulbi swell two or three times their normal size, and

become infiltrated with a sero-purulent fluid. According to Köbner, the primary changes therefore take place in the external and internal root-sheaths. The cause of the perifollicular inflammation, he finds, lies in the anatomical construction of the part, in its richness in blood-vessels and nerves, and the deep situation of the follicles.

Since the time of Bateman, therefore, the disease has been regarded by almost all writers as an inflammation of the hair-follicles, produced by irritating agents. Wertheim and Köbner were the only writers who studied the disease with the aid of the microscope, but they examined only hairs extracted from the part affected, and not the whole tissue affected; i. e., they did not examine the affected part itself.

In my own studies upon this subject I examined portions of skin taken from the living subject and affected with the eruption in its different stages, and have followed the process from its commencement to its termination, either in complete restitution of the parts, or in greater or less destruction of the skin of the affected region.

(To be concluded, with Illustrations, in next Number.)

ART. II.—*The Strumous Element in the Etiology of Joint-Disease, from an Analysis of Eight Hundred and Sixty Cases.* By V. P. GIBNEY, M. D., Assistant Surgeon to the Hospital for the Ruptured and Crippled, New York.

(Concluded from July Number.)

THIS narrows down to *two cases* with a presumable *absolutely clear record*. One of these, on admission, from the history during her stay as in-patient, and under observation subsequently as an out-patient, induced my predecessor in the hospital, Dr. H. E. Handerson, a very competent observer and thoroughly intelligent physician, to gravely doubt the existence of any hip-disease at all, and such doubts are expressed on his notes. I myself had an opportunity of observing the case, and saw no positive evidence of the disease in question. The diagnosis was coxo-femoral neuralgia.

The *remaining case* was such a typical one of acute synovitis of the coxo-femoral articulation, that in my summary I

shall report it in full. I would premise, however, that I entertain some doubt as to the correctness of the history, as given by the grandmother who placed it in the hospital.

Of the 265 cases in the table observed as to heredity, consumption was noted as occurring in the father's family fifty-three times, in the mother's fifty-six; rheumatism, or the rheumatic diathesis, in the father's fourteen times, in the mother's eight; diseases unquestionably strumous, in the father's ten, in the mother's eighteen; syphilis, in father three, mother seven; the alcoholic diathesis, in father one, mother one; and insanity, in the mother once.

Pertussis stood in a causative relationship to hip-disease eight times, hereditary disease being found in four, not found in three, and not sought in one. Scarlatina was the cause in eight instances, two giving an hereditary diathesis, four giving none, and in two this was not sought. Measles induced the disease in five cases, one having hereditary disease in the history, three being free from the influence of heredity, and in one a diathesis was not sought. Intermittent fever seemed to develop the disease twice, typhoid fever once, and cerebro-spinal meningitis once.

The next table bears upon synovitis of the knee, and gives in analysis 107 cases.

TABLE VI.—Giving 107 Cases of Knee-Joint Disease Analyzed with Reference to an Hereditary, and 103 with Reference to an Acquired Diathesis.

| | Traumatic. | Non-traumatic. | Total. |
|---|------------------|------------------|------------------|
| Number analyzed | 53 | 54 | 107 |
| Percentage of cases where heredity was found | 71 $\frac{2}{3}$ | 60 $\frac{1}{2}$ | 66 $\frac{1}{3}$ |
| Percentage of hereditary diseases as found in father | 22 $\frac{1}{2}$ | 26 | 24 $\frac{1}{3}$ |
| Percentage of hereditary diseases as found in mother | 20 $\frac{1}{2}$ | 37 | 29 |
| Percentage of hereditary diseases as found in both parents | 5 $\frac{2}{3}$ | 5 $\frac{1}{2}$ | 5 $\frac{1}{2}$ |
| Percentage of hereditary diseases as found in other children in family | 28 $\frac{1}{2}$ | 20 $\frac{1}{2}$ | 24 $\frac{1}{3}$ |
| Percentage of hereditary diseases as found both in parents and children | 11 $\frac{1}{2}$ | 13 | 12 |
| Number analyzed | 44 | 59 | 103 |
| Percentage of cases where cause was found in acquired diathesis | 18 | 42 $\frac{1}{2}$ | 33 |
| Percentage of cases where hereditary and acquired diatheses were found | 11 $\frac{1}{3}$ | 23 $\frac{2}{3}$ | 18 $\frac{1}{3}$ |

Thirty-six cases apparently clear from hereditary influences have been submitted to a more thorough analysis, which gives the following results :

The history was altogether unreliable in twelve ; an exanthem was found to account for the development of the disease in seven, a bad hygiene, together with an unreliable history, in four, bad hygiene in three, and in ten no acquired diathesis was sought. So that, among the knee-joint diseases, *not a single case* was found with an *absolutely clear record*. They were all presumably strumous.

One hundred and three analyzed with reference to an acquired diathesis, actually found to have induced the disease, give the following results :

Pertussis was the cause in four cases, in two of which an hereditary diathesis was found, and in two nothing was found ; scarlatina was the cause of the disease four times, in three of which heredity was found, and in one not found ; rubeola was the cause of one, cerebro-spinal meningitis of one, and acute necrosis of two.

Thirty-two cases of disease of the ankle-joint are analyzed with reference to an hereditary, and thirty-one with reference to an acquired diathesis, a tabular form of which is herewith given.

TABLE VII.—Giving 32 Cases of Ankle-Joint Disease analyzed with Reference to Hereditary, and 31 with Reference to an Acquired Diathesis.

| | Traumatic. | Non-traumatic. | Total. |
|--|------------|----------------|--------|
| Number analyzed..... | 15 | 17 | 32 |
| Percentage of cases where heredity was found..... | 80 | 93½ | 81½ |
| Percentage of hereditary diseases as found in father..... | 26⅔ | 35½ | 31½ |
| Percentage of hereditary diseases as found in mother | 46⅔ | 27⅔ | 31½ |
| Percentage of hereditary diseases as found in both parents. | .. | .. | .. |
| Percentage of hereditary diseases as found in other children in family..... | 60 | 53 | 56½ |
| Percentage of hereditary diseases as found both in parents and children..... | 40 | 23½ | 31½ |
| Number analyzed..... | 15 | 16 | 31 |
| Percentage of cases where cause was found in acquired diathesis..... | 26⅔ | 31½ | 29 |
| Percentage of cases where hereditary and acquired diatheses were found..... | 20 | 12½ | 16½ |

Five cases seemingly free from any hereditary taint, on being subjected to a closer analysis, were found imperfectly reported, and consequently unreliable in two instances; a poor hygiene was found in the history of one, measles was found to have caused one, and the remaining one was incorrectly diagnosed. The history of the case, the progress of the disease, and the successful termination, make it undoubtedly one of peri-arthritis. It shall be reported, however, and the legitimate conclusions drawn therefrom.

Of the thirty-two aforementioned, consumption was found in the father's family eight times, in the mother's five; rheumatism was found in the father's once; diseases scrofulous in nature were found in the father once, in the mother three times.

Scarlatina stood as exciting cause in one case of synovitis of the ankle, pneumonia in two cases, varicella in one, and rubeola in one. The latter two gave a history of hereditary disease.

The remaining joints present nothing of sufficient interest to warrant a discussion in detail, and the following table I shall present as a kind of summary.

TABLE VIII.—Showing the Number of Cases of Joint-Disease Induced by the Diseases of Childhood.

| LOCALITY. | Cases analyzed. | Pertussis. | Rubeola. | Scarlatina. | Cholera Infantum. | Rachitis. | Vaccinia. | Cerebro-Spinal Meningitis. | Pneumonia. | Intermittent Fever. | Varicella. | Typhoid Fever. |
|------------|-----------------|------------|----------|-------------|-------------------|-----------|-----------|----------------------------|------------|---------------------|------------|----------------|
| Spine..... | 209 | 15 | 18 | 4 | 5 | 4 | 3 | 1 | 1 | 1 | 1 | .. |
| Hip..... | 271 | 8 | 5 | 8 | .. | .. | .. | 1 | .. | 2 | .. | 1 |
| Knee..... | 103 | 4 | 1 | 4 | .. | .. | .. | 1 | .. | .. | .. | .. |
| Ankle..... | 31 | .. | 1 | 1 | .. | .. | .. | .. | 2 | .. | 1 | .. |
| Total..... | 614 | 27 | 25 | 17 | 5 | 4 | 3 | 3 | 3 | 3 | 2 | 1 |

NOTE.—Rheumatism in one case of hip-disease, and acute necrosis in two cases of synovitis of the knee.

To present in review the statistical work just dwelt upon, I have arranged the following :

TABLE IX.—*Giving a Resumé of Tables IV., V., VI., and VII.*

| | Spine. | Hip. | Knee. | Ankle. | Total. |
|--|--------|------|-------|--------|--------|
| Number analyzed..... | 185 | 272 | 107 | 32 | 596 |
| Percentage of cases where heredity was found..... | 76½ | 60½ | 66½ | 81½ | 68 |
| Percentage of hereditary diseases as found in father..... | 35½ | 30½ | 24½ | 31½ | 30½ |
| Percentage of hereditary diseases as found in mother..... | 38½ | 29 | 29 | 31½ | 32 |
| Percentage of hereditary diseases as found in both parents..... | 31½ | 6¾ | 5½ | ... | 6½ |
| Percentage of hereditary diseases as found in other children in family..... | 15¾ | 25¾ | 24½ | 56½ | 29 |
| Percentage of hereditary diseases as found both in parents and children..... | 16¾ | 15 | 12 | 31½ | 16 |
| Number analyzed..... | 209 | 271 | 103 | 31 | 614 |
| Percentage of cases where cause was found in acquired diathesis..... | 45½ | 18¾ | 33 | 29 | 30½ |
| Percentage of cases where hereditary and acquired diatheses were found..... | 22½ | 10 | 18½ | 16½ | 16 |

Can Joint-Disease occur in a Non-strumous Child?—At the meeting of the New York County Medical Society, March 26, 1877, in the discussion which followed the reading of this paper, Dr. Lewis A. Sayre propounded the above question, or what I take to be its equivalent, viz.: “Can Pott’s disease of the spine, or hip-joint disease, develop from an injury in a child in perfect health and absolutely free from any hereditary diathesis?” The question was propounded for Dr. Frank Hamilton, who had just spoken, or myself, to answer. Dr. Hamilton answered in the affirmative. A remark of no less a distinguished surgeon than Prof. S. D. Gross was given by Dr. Sayre, which was that hip-joint disease could not occur in any man, woman, or child, unless a tuberculous diathesis be present. Such a statement, I confess, caused some surprise, and induced me to conduct a more thorough analysis of such cases as I had hastily recorded in my paper, then

incomplete, wherein "nothing found" was specified. As such cases have been given in analysis under their respective subdivisions, viz., under caries of the vertebræ, hip-disease, synovitis of the knee, and synovitis of the ankle, in accordance with a statement already made, I propose to detail the cases in this connection.

CASE I.—Joseph Blum, aged twenty, native of England, was referred to the hospital by Dr. Frank Hamilton, on December 28, 1876. From the patient I learned that he was a race-rider by vocation; that his family history was good, the father, a brother, and a sister, being artists in the dramatic profession, of excellent physical development, and always enjoying good health. (I find that I have no note concerning the health of the mother, or any history of her own family at all. My impression, at this writing, is that I did not investigate that branch of the family, but simply rested satisfied with "family history good." I have further to observe, that my mind, at the time of taking the history, was intently fixed upon the plaster-of-Paris jacket he claimed to have worn in the early part of 1873, and *special* attention was not given to the family history.) He reported himself as always enjoying excellent health prior to a fall from a horse in August, 1872. This fall was very severe, doing great violence to his cerebrospinal system. He was taken up insensible, and borne to the Royal Infirmary, in Liverpool. Says that partial consciousness returned in about three days; that there was complete paralysis of motion in both lower extremities, with almost complete loss of sensation; that the right upper extremity was paralyzed, and likewise very painful, while the left was incompletely paralyzed; that he had violent headache; that his fæces passed involuntarily, while the urine, he thinks, was retained. He is positive in stating that at this time there was no deformity whatever of the spine. At the end of two months he began to use his legs feebly, and at the end of four months—the beginning of 1873—could with great difficulty stand alone.

At this time, he avers, a Dr. Barnet, of the Infirmary, suspended him by the shoulders and applied a plaster-of-Paris jacket from the axillæ to the pelvis; was then taken down and kept extended on the table until the plaster had hard-

ened. He claims that he did not walk immediately afterward, but was placed in bed for nine days, at the end of which time he was "all swelled," making a removal of the plaster necessary. Four or five days later a Dr. Armstrong came from London, and reapplied the plaster jacket, after "his own plan;" which was, to anæsthetize the patient, extend him on a table, and then lay strips of pasteboard longitudinally along the body and apply the plaster thereover. This seems to have been comfortable and to have met the indications, and was worn for three months, he still keeping his bed, however, on account of inability to walk, for nine or ten weeks after the application. When the plaster was applied there was no knuckle or deformity of the spine, he says; and from this statement, and from the fact that he was so long regaining the use of his limbs, I take it that the treatment then adopted was not for supposed spinal caries, but possibly for a suspected fracture (I use the term "suspected" because of the presumable absence of any deformity, which certainly would have come to the knowledge of the patient), or for a weakened condition of the spinal column dependent on the intra-spinal lesion.

This jacket was removed when it had crumbled much, and, the patient having gone to his home, a third one was not applied. He felt the need of support for his head, however, and procured a steel brace with a head-support. At this time he feels quite sure there was no deformity. This brace was worn a short while, but was thrown off on account of the pain caused thereby. A kind of wheel crutch was then resorted to, and after a short while a slight deformity was observed in the cervico-dorsal region. This has slowly and steadily increased in size, and now, at date of present observation, there is a great prominence, including all the dorsal vertebræ, measuring from highest point to the vertical axis two and three-quarter inches. There is also marked spinal tenderness in dorso-lumbar region, with hyperæsthesia, shooting pain, uneasiness in any posture for any length of time, etc., etc.

A single suggestion with regard to the case just reported, and I pass to the next. That the cerebro-spinal disease, or intra-spinal disease, was due to traumatism, I have no doubt

whatever; but, in the absence of data which it was impossible to get from the patient himself, I do doubt the relationship of cause and effect between the severe fall and the caries of the vertebræ. The severity of the nervous disease seems, to my mind, competent to have produced or developed in the boy a strumous diathesis, which rendered him vulnerable; and his prolonged convalescence, taken in connection with the unsteadiness and feebleness of his limbs, must have subjected him to frequent falls, which may have caused the caries in the subject thus cachectic.

CASE II.—James S., aged thirteen, of Irish parentage, was admitted to the hospital as an in-patient, September 4, 1871. He lives at Yorktown, in a good location, while the house is large, and, from all accounts, well ventilated. (These notes were all taken at the date of admission.) The mother is strong and hearty, as is likewise the father, and both give good family histories. They have eight children, all of whom are in good health. The only disease the boy has had is rubeola (when, not stated). Was thrown from a sledge about eight months ago, and run over, though no serious results were noticed immediately—in fact, not for a month thereafter; then, however, he began to complain of pains in the side, abdomen, and along the course of the spinal nerves generally. Before a great while a small knuckle was found projecting in the spinal column. His condition on admission was that of a healthy-looking, well-nourished boy. He walked freely, yet with considerable stiffness of the spine, and with strong inclination to rest hand upon the left thigh. A perceptible prominence of the spinous processes of the eighth and ninth dorsal vertebræ was observed, and so noted. While under treatment, he experienced an attack of facial erysipelas and an acute pleurisy.

The disease for which he came under treatment was arrested, and no abscess formed. He remained under observation until October 19, 1872, when he was discharged relieved.

The only comment I have to make on this case is what I have already made when speaking of the same case on page 19, viz., that, in taking the history, it was my custom then to ask for consumption only, not pushing the investigation to

any great extent; and the absence of any note concerning the date and sequelæ of rubeola makes the history, to my mind, to a certain extent unreliable.

CASE III.—John M., aged five years, born in New York; mother Irish; father Canadian, aged thirty-three, and in good health. The mother is healthy, and has four other children, who are, and always have been, perfectly healthy. Date of admission to the hospital, September 10, 1874. Residence, 84 Laight Street (hygienic surroundings, etc., not specified). The boy has never been vaccinated, and has had none of the exanthemata. Has never met with any accident since his second year, when he fell into a tub of lime-water, which did not seem to affect him permanently. For three months he has been unable to stoop without pain, and has had other symptoms pointing to some lesion of the spinal column.

His complexion is sallow, eyes gray, and hair light; tongue slightly furred. He is tolerably well nourished; pulse 96, respiration 24, temperature $99\frac{1}{4}^{\circ}$. Stands with body bent forward a little, and stoops with spinal column held preternaturally stiff. The motion at the hip-joints is unimpaired. Physical examination of the thorax is attended with negative results. Spinal column shows loss of natural curve below cervical region, with slight antero-posterior curvature from the first dorsal to the last lumbar, deviating likewise to the right side. *No spinous process* is projecting beyond the others, though there is a suspicious feebleness at last dorsal and first lumbar. The nates are normal in contour. There is a small patch of eczema over right parietal bone, and the submaxillary glands on both sides are enlarged. A diagnosis of caries of the vertebræ was made, and a brace was applied. The treatment was supplemented by an alternative tonic.—Nothing worthy of note occurred until October 25th, when he was vaccinated from the scab which came from a child supposed to be in perfect health. (A number of other children under observation were vaccinated at the same time from the same source, and the results of nearly all were excellent.) November 1st, were symptoms of cellulitis in the vaccinated arm, and over the site of the operation a charcoal poultice was applied, which soon arrested the inflammatory process. December 10th, the arm

was about well. January 16, 1875, there was a note to the effect that no deformity was arising. February 20th, the spinous process of the first lumbar was observed to be more prominent than that of the other vertebræ. April 7th, there was a large unhealthy-looking scab over the site of the vaccination which was made in October last. April 22d, the angle of curvature was well marked. May 5th, examination pursuant to removal. General health fair; stands erect, and walks with ease, scab of old vaccination disposed to heal; spinous processes of first and second lumbar vertebræ quite prominent, and there is occasional epigastric pain.

The above notes I have copied from the hospital case-book. The history was taken by one comparatively inexperienced in such work, and, from the absence of some negative points which should have been observed and noted, I hesitate to accept the history as perfectly reliable. All the more do I doubt the reliability when I find the peculiar course the vaccination took. I feel assured in believing that the disease of the spine was not of sufficient intensity to cause the strumous diathesis which was manifest through the peculiar type of vaccinia. The element of pertinacity was certainly present, and, to my thinking, this vaccinia was proof that an inherited or acquired diathesis had been overlooked in the history.

CASE IV.—Acute synovitis of left hip. Lawrence McL., aged eleven, was placed in the hospital by his grandmother, August 3, 1876. From the old lady the history was obtained, and is as follows: Family history good; five children in the family, all living, and all, save subject of present notes, in good health. The hygienic surroundings are moderately good. Health during infancy was good, has been vaccinated, has had rubeola and pertussis, with no sequelæ. One week ago, without any known provocation, he suddenly complained of weakness, tenderness, and pain, in the left hip, which symptoms have increased to the present time.

He is of fair complexion; dark hair, and brown eyes; is fairly nourished. Stands with the left hip advanced, semi-flexed and everted, and walks with a decided limp. The left natis is broadened, considerably tumefied, and there is marked tenderness on pressure over the trochanter. The superficial

inguinal ganglia are enlarged. Thigh can be extended to an angle of 165 degrees without tilting the pelvis. There is limited motion at the joint, but any attempt to flex is opposed by muscular resistance, ad and ab-duction being likewise opposed. No shortening, and no atrophy. Pain is complained of when the articular surfaces are approximated. The diagnosis was made, as is stated above, and on the day following a more thorough examination was made. The surface-temperature on left side over the trochanter was 2° lower than that at same point on right side. Measurement around groin and over trochanter for the right side was fifteen and a half inches, while on the left side it was seventeen and a half; from coccyx to anterior superior spinous process, right side eight inches, left side nine. A blister 4×4 was applied at bedtime.

August 12th.—The blistered surface was poulticed with flaxseed meal on the following morning, and renewed every six hours for three days, then dressed with simple dressings until healed. There is one and a half inch difference now in the size of the nates, as measured around groin and over trochanter.

August 20th.—The swelling has perceptibly diminished; the boy is free from pain, and the limb is almost straight.

August 28th.—Walks with only a very slight limp. No resistance to flexion, extension, ab or ad-duction. There is no difference in size or in length of limbs. The measurements over trochanter and around groin on both sides are identical; those from coccyx to anterior superior spine, on both sides, likewise identical. The surface-temperature over left trochanter is $\frac{1}{2}^{\circ}$ higher than that over left. There is still a shade of flattening.

October 2d.—The contour of the natis is to all appearance restored. There is no pain, no tenderness, no limp.

October 13th.—Discharged cured.

If the case last recorded be non-strumous, as I have reason to believe, in view of the course taken by the disease, I think those who hold to the traumatic origin of joint-disease can with propriety claim this one—i. e., if we had any evidence that a fall could be found to have occurred.

To sum up from Table IX. Of 596 cases analyzed with

reference to hereditary and 614 with reference to an acquired diathesis, I have succeeded in finding only *one* case of which it can be surely said there was no struma complicating. The three cases of spinal disease which I have reported may be classed by some as non-strumous, but I feel sure others will differ in their opinion.

I think I am prepared to answer the question now, as propounded by Dr. Sayre. Whatever other observers may have experienced, I feel warranted in stating, from a careful study of the cases whose analysis is here recorded, that true chronic joint-disease *cannot* occur in a non-strumous child. I believe that a *slight* injury often develops or acts as exciting cause, but never induces the disease unless a *predisposing cause* be present. I am not prepared, with Prof. Gross, to admit that that predisposing cause is always a transmitted tubercular diathesis; but I am firmly convinced that it lies in a morbid condition, which is either hereditary and permanent, or acquired, whether temporary or permanent. My classification of traumatism and non-traumatism is a bad one, but I chose it to bring out in bolder relief the facts which my statistics afford.

Are Chronic Joint-Diseases ever the Cause of the Strumous Diathesis?—MR. T. HOLMES, in his “Surgical Treatment of Children’s Diseases,” on pages 337, 338, after speaking of the causes of struma, makes the following observation:

“I believe, also, that protracted suppuration is an efficient cause of tuberculosis, and that many of the exhausting joint-diseases which prove fatal ultimately by phthisis, and are therefore set down as strumous, were really themselves the cause, and not the effect, of the tuberculous diathesis.” From a careful reading of Mr. Holmes’s remarks on struma, I came to the conclusion that he made only a *difference in degree* between the strumous and the tuberculous diathesis. Dr. Sayre holds, I believe, to substantially the same doctrine. That a joint-disease long continuing does sometimes develop struma in a child already predisposed, I have not the slightest doubt; but that it *causes* the diathesis *de novo*, as scarlatina causes it, or as rubeola or pertussis causes it, I entertain grave doubts. As bearing on the question, I have selected such cases as have been under observation during a period varying between six

months and six years, and have analyzed them closely, including in my table those wherein amyloid degeneration developed, wherein adenia, tuberculous meningitis, recurring naso-facial erysipelas, chronic recurring phlyctenular conjunctivitis, scorbutus, diseases of other joints and of the bones, and several types of vaccinia occurred. Three hundred and twenty cases were found for observation, and of this number two hundred and thirty-six gave no evidence of strumous disease in any other locality. Manifestations undoubtedly strumous were observed in eighty-two, while in fifty-two of the two hundred and thirty-six there was exhaustion in its various degrees. Before giving the different types of struma as developed while the patients were under observation, I propose to show what number of those wherein exhaustion was a prominent feature actually developed any strumous signs in localities or tissues other than the joints; also, to show whether such developments were due to the exhaustion, or to other well-known causes or conditions which were present, and which were noted in the histories.

Those fifty-two cases, I may as well state, were cases in which long-continued suppuration existed, and in which exhaustion pure and simple was the only sign noticed. Seventeen of these were in the hospital from six to twelve months, and fifteen I saw twice a day during the whole of their hospital sojourn; twenty-one were in the hospital from one to two years, and all of them, likewise, I saw twice a day. Eight were under the same daily observation for periods varying between two and three years. The remaining six were under observation from four to five years, one as an out-door patient, the others as in-door patients. I am thus specific lest some one may say that strumous manifestations may have appeared and soon disappeared, no note having been made. I have kept faithful records of the cases, and such can be found at any time on the hospital case-books. Furthermore, twenty-three of the fifty-two died from exhaustion induced by the long suppuration, and no struma in other localities occurred. I can with assurance, then, state that in fifty-two cases of suppurating joint-disease this diathesis was not manifest extrathritic.

A further analysis of the fifty-two cases of exhaustion gives

the following result: In sixteen, no attempt was made by the historian to trace any hereditary diseases in either member of the family, or the connection of any of the diseases of infancy with the joint-disease; in thirty-six, a predisposing cause was found either in a transmitted or an acquired diathesis, or in both. Twenty-seven gave hereditary diseases in the parents, and evidence of acquired struma was found in twenty-five. The hereditary diseases were found more frequently in the father than in the mother, in the proportion of about two to one. Evidences of strumous disease were found in other members of the family in fourteen instances. In every case, then, exclusive of the sixteen in which no attempt was made to ascertain the existence of a possible predisposition, a cause, in a greater or less degree adequate, was found for the severity of the disease; in other words, a strumous diathesis, either hereditary or acquired, could with reasonableness be predicated of every case.

TABLE X.—Showing what Number of 320 Cases of Joint-Disease, thus analyzed, developed Strumous Diseases in Other Parts of the Body.

| | Amyloid Degeneration. | Adenia. | Recurring Naso-Facial Erysipelas. | Tubercular Meningitis. | Recurring Phlyctenular Conjunctivitis. | Scorbutus. | Bone-Lesions and Multiple Arthritis. | Severe Vaccinia. | Totals. |
|---|-----------------------|---------|-----------------------------------|------------------------|--|------------|--------------------------------------|------------------|---------|
| Number..... | 22 | 18 | 13 | 10 | 7 | 5 | 4 | 3 | 82 |
| Number where hereditary diseases were found..... | 12 | 14 | 11 | 8 | 4 | 1 | 3 | 2 | 55 |
| Number where an acquired diathesis was found..... | 20 | 12 | 8 | 7 | 5 | 4 | 4 | 2 | 62 |
| Number where neither family nor personal history was sought.. | 3 | 2 | 2 | 1 | 1 | 1 | .. | .. | 10 |
| Number where either hereditary or acquired diathesis was found. | 19 | 16 | 11 | 9 | 6 | 4 | 4 | 2 | 71 |
| Percentage where diathesis was found..... | 86½ | 89 | 84½ | 90 | 85½ | 80 | 100 | 67 | 86½ |

From the table just given, the different tissues which were attacked by the strumous disease are shown in the first column; and, before treating of these seriatim, I shall give the number of cases in which exhaustion from prolonged suppuration preceded the development of the strumous diathesis in the tissues and localities noted in my table. A certain number were free from any congestion abscess even, and there was no evidence of any suppuration at all. This number I shall also give, with remarks.

Of the eighteen cases affected with strumous disease of the lymphatic ganglia, such as I have classed as cases of adenia, only one suffered from any exhaustion consequent on suppuration prior to the glandular infiltration. One has recently died of phthisis, having developed multiple joint-disease before any marked phthisical signs were discovered. The family history of this case was not obtained with sufficient accuracy to warrant the assertion that it was very good. The father I knew to be dead—of what, I did not know—while the mother presented a face and expression typically strumous. The hygienic surroundings prior to the admission of the patient into the hospital were by no means such as could be desired. Notwithstanding, from my observation of the case, from the known profuseness of the suppuration, and from the length of time the suppurative process existed prior to any signs directing my attention to the pulmonary organs, I felt convinced that this afforded a fine illustration of the development of *phthisis* from prolonged *strumous* suppuration. It will be seen, from the advised use of the adjective “strumous,” in the sentence just completed, that I regarded the case as unquestionably such prior to the invasion of the pulmonary disease which proved fatal. In the thirteen cases with recurring nasal and facial erysipelas as the exponent of the strumous diathesis, there was no suppuration in nine; the suppuration was very slight and not at all exhaustive in two, while in two there was prolonged suppuration antedating the first appearance of the lesion under consideration, and in both of these two the family histories were sufficiently poor to account for a transmitted tubercular diathesis. Consumption was found on both sides, and an exanthem as an exciting cause of the

joint-disease in one; while in the other the mother's family was decidedly consumptive, and an acute necrosis in three or four different localities was the exciting cause of the joint-diseases.

There was no suppuration in five cases dying of tubercular meningitis, but there was some excitement from the pain incident to the disease of the joint in four of this number, while in one there was no severe pain at any time. In five, long-continued suppuration produced exhaustion, which was thought to have been the exciting cause of the meningeal disease; but in one of the five pertussis, severe in character, occurred just prior to the prodromatous period of the fatal tubercular meningitis, and could with propriety have been considered as the cause. One case recovered under the administration of heroic doses of ergot, and one was complicated with localized cerebritis as proven by autopsy. Hereditary predisposition was strongly suspected in one of the remaining two (history not obtained), and found in the other. It was likewise found in the remaining three of the five. Among the cases in which strumous disease developed as chronic and recurring phlyctenular conjunctivitis, four occurred prior to any suppuration, and in three there was no suppuration while under observation. The five cases illustrating the scorbutic diathesis did not suffer from exhaustion of any kind; in fact, no suppuration was at any time present prior to the development of the diathesis. Other joints became involved in four instances, but no suppuration preceded this occurrence. Of the three who suffered from an unusually severe and chronic vaccinia, two had been the subjects of suppurative disease of the joints, while one of these even bore marks of struma about the cervical region and in the eyes, reported to have antedated the suppuration, and in the other consumption was found on the mother's side, rheumatism (chronic articular) on the father's. One case *seemed* singularly free from any hereditary or acquired taint, as also from any suppuration. This is Case III., reported in another portion of this paper, page 30.

The whole number of the cases of amyloid degeneration—twenty-two—suffered a more or less degree of exhaustion from prolonged suppuration.

To resume, then. Of the number analyzed with reference to the question of exhaustion from prolonged suppuration causing the strumous diathesis, eighty-four were found to have been the subjects of exhaustion in various degrees of severity. In fifty-two no strumous manifestations in other portions of the body than the joint thus affected occurred during the period of observation; in nine there was strumous disease elsewhere manifest, but the facts go to show that the predisposition existed prior to the suppuration and exhaustion, and had actually shown itself in some instances; hence the disease, or diathesis, was simply *developed*, and not caused *de novo*, by the exhaustion. In the twenty-two cases of amyloid degeneration of the liver and kidneys, exhaustion was the exciting cause in every one; but from the table it will be seen that in nineteen out of the twenty-two an efficient predisposing cause was found, while in the remaining three no such predisposing cause was sought. If amyloid disease be strumous, it may be interesting to know why this peculiar type of struma should occur—what factors are necessary to its production. I have often wondered why some cases of joint-disease could suppurate profusely for months, and for years even, and no amyloid changes in liver or kidneys occur. We have only twenty-two of the eighty-four cases of exhaustion, or about twenty-seven per cent., terminating in this lesion; and the suppuration in the twenty-two was not greater, and did not extend over a longer period, than that of the fifty-two of uncomplicated exhaustion. It is a significant fact, that in every case of amyloid disease where a family history was sought—twelve in number—an hereditary disease was found; and this hereditary disease—a fact still more significant—was found to be pulmonary consumption in ten out of the twelve. The consumption was in the father in five instances, in the mother in six, being found in both father and mother once. One history of the two remaining gave chronic rheumatism in the father and in the mother, while strumous diseases were found in other members of the family; the other gave habitual drunkenness in the father, and probable consumption in the mother, a wretched hygiene being found as an element of no little importance. In seven no family history was obtained, but the personal history gave an exan-

them as causing or developing a strumous diathesis, associated with a bad hygiene in two, unassociated with a bad hygiene in one. Bad hygiene was found to have existed in a highly probable causative relationship to the joint-disease, and its severity, in five cases, one of which was furnished with additional evidence of struma, by the existence of such diseases in other members of the family. In no one of these cases was even a personal history obtained. Hence the data, for conclusions are very imperfect so far as the last five are concerned; in fact, the whole ten, where no family history was obtained, are valuable only so far as their harmlessness to a theory is concerned. Amyloid changes have been observed in the glandular tissues almost exclusively. The theory to which I have referred is, "The lymphatic diathesis is in most cases congenital, and transmitted from generation to generation."¹

I believe that, if Billroth had asserted that such was the fact in *every case*, his assertion could not have been disproved.

The question, then, raised at the beginning of this branch of my subject, "Are chronic joint-diseases ever the cause of the strumous diathesis?" cannot be answered *affirmatively* by the history of any one of the three hundred and twenty cases I have had under observation. That chronic joint-disease sometimes develop strumous disease in other localities in an individual in whom a predisposition already exists, twenty-two of my cases abundantly prove. Yet, as my analysis furnishes proof incontestable that the joint-disease itself is strumous, it remains for other investigators to prove that chronic joint-diseases, by any amount of suppuration, ever *develop* even a strumous diathesis. *I cannot prove the assertion.*

To a consideration of some of the complications of joint-disease, or, rather, to some of the lesions which furnish corroborative evidence of the existence of a strumous diathesis, my attention shall now be directed. From Table X. it will be observed that eighteen cases of adenia were found to have developed during the course of the joint-disease. Two of these were not investigated as to the possible existence of any hereditary or acquired diathesis, and consequently are value-

¹ Billroth's "Surgical Pathology." Translated by Hackley. New York, 1874. P. 390.

less as data. Of the sixteen investigated, every one gave presumptive evidence of a diathesis either transmitted or acquired, and in fourteen hereditary diseases were found in the family, while in eleven the exhaustive diseases of childhood stood in a causative relationship with or without the influence of heredity. The hereditary diseases were found in the father six times, in the mother eight times, and strumous diseases in other members of the family three times.

The ten cases of tubercular meningitis were examined with reference to heredity, and the exanthemata in every instance but one, and in the whole nine thus examined not one gave a clear record. In eight, consumption was found in the father four times, in the mother three times, both father and mother once; syphilis was found in the father once, and in the mother, same case, a scrofulous disease was unmistakably present; and heart-disease occurred in the father in one instance. A strumous diathesis was found to have been developed by the diseases of infancy in seven instances, this number, of course, including those with and without hereditary influence. From my cases it can be almost conclusively proven that tubercular meningitis is a transmitted disease.

With regard to the occurrence of a recurring naso-facial erysipelas, Dermatology—so I am informed by one or two of my dermatological friends who are regarded as authority—does not recognize such a lesion. This has been observed time and again in thirteen of our joint-cases, and I have for a long time regarded the affection as typically strumous. This subject I shall elaborate at a subsequent time. While studying the subject clinically, however, I have seen an abstract of a thesis by M. J. Courbon, Paris, 1873, in which thirteen cases of strumous recurrent facial erysipelas are reported. Hufeland¹ speaks of "the nose itself a little swelled, red, and shining."² This, however, hardly characterizes the affection, and a reference to the recurrency is not made.

In the thirteen cases of Table X., a history neither family nor personal was obtained. Of the eleven whose history was obtained, hereditary diseases were found in every instance,

¹ "Half-Yearly Abstract," vol. lviii., page 86.

² "On the Scrofulous Disease," page 74.

and previous strumous manifestations developed by infantile diseases in eight of this number. The father was the subject of hereditary disease in seven, the mother in six, and both in two instances. Other members of the family bore additional evidence three times.

A recurring phlyctenular conjunctivitis was observed in seven of the cases analyzed, and in one no history was sought. All of the six whose history was sought, gave heredity and diseases of childhood as possible factors in the production of the diathesis. Hereditary diseases were found in four, the father being the subject in only one. An adequate cause for five was found in the exanthemata.

The cases in which a strumous diathesis was shown by an unusually severe vaccinia have already been discussed, and demand no further analysis in this connection.

Of the four cases complicated by disease of the shaft of the bone and by multiple arthritis, an adequate predisposing cause was found in every one. A few words relative to the scorbutic diathesis as coexistent with the strumous. Dr. James Knight, among modern writers, refers to the scorbutic in contradistinction to the strumous diathesis, as follows:

"That it [*morbus coxarius*] occurs in scrofulous children, not a doubt can be entertained; but it is often observed in individuals who do not present a single indication of a strumous diathesis—if we confine the strumous diathesis to tubercular deposits involving the glandular and parenchymal tissues. In many patients laboring under *morbus coxarius* the scorbutic diathesis is decidedly indicated by spongy gums, mouth bleeding at nights, and aphthous condition of the mucous membranes, and no enlargement of the glands nor the most remote tendency to phthisis-pulmonalis in after-life. This condition may be considered as the 'strumous inflammation without tubercle' of some authors."¹ I have observed five such cases, i. e., cases in which a scorbutic element seemed to preponderate; but, as sufficient evidence was found for the predisposition to a strumous diathesis in four of the five whose histories were obtained, I cannot say that I have seen any who do not present a single indication of the strumous diathesis. These cases are

¹ "Orthopædia," page 258.

to me very interesting, and I had intended to incorporate complete histories of one or two, but space forbids. Dr. Knight has assured me, however, that some time soon he purposes writing a special paper on this subject.

Mortality.—To make my analysis the more complete, and as contributing what I know to be reliable statistical facts to a subject about which there are so many extravagant statements, I have taken five hundred and forty-five cases, with the full histories of which I am personally acquainted, and have constructed a mortality-table. This does not represent at all the mortality of the cases treated exclusively at the hospital. It includes both those who died while under treatment at the hospital, either as in or out-door patients, and those who came under the hospital treatment in different stages of the disease, remained an unsatisfactory period, and were removed to other institutions in many instances, and in other instances to the care of the family physician. Very many of this latter class of patients I have followed closely, recording all reliable information to make the histories as nearly complete as possible. Many of the cases not proving fatal have recovered in different stages of the disease; i. e., all disease is arrested with or without deformity, while on the other hand many still suffer, some in the second stage with abscess forming, and some in the third stage with suppuration more or less exhausting. A few have undoubted amyloid degeneration in progress, and a certain proportion are in such a condition as to make the prognosis grave. Still I have only recorded among the dead those whom I know to be dead, and none who were probably dying when last heard from. My experience with children has made me very skeptical about reports as to “impending death” and “can’t possibly survive long.” The tenacity with which some children cling to life is astounding. I know of children suffering in the exhausting stages of joint-disease, whose death has been daily looked for during a period of eighteen months. I have seen children whose life for an indefinite period seemed to hang on a thread, and yet that thread seemed as tough as an ocean-cable. I am digressing, however, but shall confine the rest of my remarks to the facts as recorded in the table.

TABLE XI.—*Showing the Percentage of Deaths in 545 Cases.*

| | Hip. | Spine. | Knee. | Ankle. | Total. |
|--|---------------------------------|----------------------------------|-------|--------|--------------------------------|
| Number analyzed..... | 288 | 128 | 106 | 23 | 545 |
| Percentage of deaths from disease itself .. | 4½ | 10½ ⁵ / ₁₆ | 7½ | 8¾ | 6¾ |
| Percentage of deaths from amyloid degeneration..... | 4½ | 5½ | 2 | 9 | 4½ ¹ / ₇ |
| Percentage of deaths from tubercular meningitis..... | 1¾ | 2½ | 2 | .. | 1¾ |
| Percentage of deaths from disease itself and amyloid degeneration..... | 9½ ¹ / ₁₆ | 16½ | 9½ | .. | 10¾ |
| Percentage of deaths from disease itself, amyloid degeneration, and tubercular meningitis..... | 10¾ | 18¾ | 11½ | .. | 12¾ |
| Percentage of deaths from other diseases.. | 1¾ | 2½ | .. | .. | 1½ |

The deaths from amyloid degeneration, it will be seen, are first tabulated separately, and then in connection with the deaths from exhaustion simply, or from the disease uncomplicated. When it is remembered that all the cases in which the amyloid changes developed were subject to exhaustion from prolonged suppuration, a sufficient reason will occur to any one for the grouping of the two together.

The mortality from tubercular meningitis is likewise confined to a separate column; but as all the cases, save one, occurred under such circumstances as to lead me to believe that the joint-disease, either from the irritation induced by frequently-recurring paroxysms of pain, or from suppuration, acted as an exciting cause of the tubercular meningitis, I have also combined the deaths from this source with those from the disease itself, and from amyloid degeneration. The exceptional case to which reference has been made was one in which much suppuration had occurred, but had subsided at a period too remote from the invasion of the meningeal disease to stand in a causative relation. Pertussis, as I have mentioned in another portion of my paper, seemed to stand in this relation in this particular case. There is one other case which I did not except, seemingly excited by an attack of varicella; but, as the child was suffering from much pain incident to the

joint-disease, I therefore regarded the varicella as coincidental.

The deaths from diseases in no way connected with the joint-disease are simply given to complete the table. Before proceeding to a summary, I wish to acknowledge my indebtedness to the kindness of our clinical clerk at the hospital, for the mathematical execution of the tables herein embraced.

Summary.—When I began my paper, I stated that I had no theories to establish, nor had I. I cared not whether my analysis resulted in sustaining the theory of traumatism or that of struma. I made the division of traumatism and non-traumatism simply to better study my subject. I find, now, that I did well not to put in antithesis traumatism and struma. That would have been very unscientific, and altogether impracticable. The cases whose histories I have studied and herein tabulated go to confirm the old theory of a strumous diathesis being at the base of all chronic joint-disease. I find that ninety-nine cases out of eight hundred, or 11.50 per cent., were developed prior to the second year, and five hundred and fifty-nine, or sixty-five per cent., prior to the fifth year; that of five thousand four hundred and sixty-one cases, fifty-three and one-quarter per cent. were males, and forty-six and one-quarter per cent. were females; that the hip-joint was the more frequently affected, the percentage being about forty-two per cent. Three hundred and fifty-nine cases were recorded as traumatic; i. e., a fall or other injury was found, on the testimony of the parents, to have preceded the invasion of the disease in such an intimate relationship as to be considered the exciting cause. Percentage, forty-one and three-quarters. Ninety-seven of this number were very doubtfully traumatic, the percentage then being reduced to twenty-nine and one-third. In four hundred and eighty-three cases, no fall or injury as an exciting cause could be found, and were classified as non-traumatic. Percentage, fifty-six and one-fifth.

Of the whole number supposably traumatic, seventy-two per cent. were found to have given in their family histories some one or more of the hereditary diseases, sufficiently marked to account for a transmitted diathesis. Twenty-two per cent. gave personal histories of some one or more of the

diseases of childhood occurring with severity in such relationship with the invasion of the disease as to be considered in the light of exciting causes, apart from any influence of traumatism.

Fifty-seven per cent. of the cases traumatic gave, then, in the family or the personal histories, unquestionable evidence of either an hereditary or an acquired diathesis, answering to that generally called strumous. Twenty-three per cent. of these cases were not investigated as to family or personal history. Twenty per cent. seemed to merit the predication of "nothing found," but, on closer analysis, only *one* case remained out of three hundred and fifty-nine whose histories were recorded, and even this could with propriety be followed by a note of interrogation. It is in evidence, then, that every case supposed to be traumatic, which gave a full and reliable history, was *vulnerable by a predisposition*, and was simply induced by the *traumatism as an exciting cause*.

In seventy-three per cent. of the non-traumatic cases, some one or more of the hereditary diseases were found in the family history, and consequently presumptive evidence of a transmitted diathesis could not be excluded. Thirty-eight per cent. gave in the personal history some one or more of the diseases of childhood, known to possess the power of causing or developing the strumous diathesis, occurring at a period sufficiently near the inception of the joint-disease to stand in a causative relation. Fifty-nine per cent. gave in either family or personal history evidence of a transmitted or an acquired diathesis. Twenty-nine per cent were not investigated as to family or personal history.

Twelve per cent. were, to first appearances, free from any hereditary or acquired diathetical influence, but, on more rigid analysis, there could be found only *two* cases out of four hundred and eighty-three, the histories furnishing reliable data, and one of these could not with justice be called a chronic joint-disease, while the other admitted of reasonable doubt as to admissibility in evidence. So, then, all the cases, traumatic and non-traumatic, gave, with the one or two possible exceptions above recorded, histories the facts connected with which proved conclusively the existence of a strumous *element*,

at least in the etiology, and established, as far as facts and figures can establish, the untenableness of the traumatic theory as generally understood. It was very gratifying to me, on the occasion of the reading of this paper before the County Medical Society of New York, to hear Dr. Lewis A. Sayre, who is regarded as the distinguished exponent of the traumatic theory, correct in forcible terms a wide-spread misconception as to his teachings. He stated that he had been reported as teaching that only healthy children could get joint-disease, while strumous children were exempt from it. This report he characterized as an unfounded misrepresentation. He further remarked that he believed a strumous child could the more easily get joint-disease, a fall or other injury being present as an exciting cause. From Dr. Hamilton, however, he exacted the admission that children in perfect health, and with a family and personal history absolutely free from taint, could acquire Pott's disease or hip-disease from traumatism. This admission I have not been able to verify by a closer study of my cases.

All this question of etiology, then, must have some practical bearing. The successful treatment of these maladies attended with so much suffering, productive of so much deformity, much of which is often irremediable, and the mortality—a lingering mortality, too—of which is between ten and twelve per cent.—the successful treatment, I say, is the prize to the attainment of which all our labors should tend. That many diseases essentially constitutional demand local treatment, no sane man will deny; and, with a proper understanding of the constitutional vice on which the local lesion depends for its existence, no sane man will assert that local treatment alone will meet all the indications.

ART. III.—*Phimosis: A Report from the Surgical Section to the New York Academy of Medicine.* By LEROY MILTON YALE, M. D., Surgeon to Charity Hospital, etc.

GENTLEMEN: This paper is presented as a report from the Surgical Section of the Academy, in accordance with the

requirement in the Constitution of the Academy. The reporter would offer, as an excuse for the imperfect collation of authorities, the fact that he had not purposed to report until the autumn, but determined to do so at this time in response to a request from the President.

Phimosis is differently defined by different writers. By some the term "is applied to that condition of the penis in which it is impossible to retract the prepuce behind the glans." Others restrict it to those cases in which the inability to retract the foreskin is due to narrowness of the preputial orifice. In the present report the former—more general—definition will be accepted, as the disorders arising from the condition seem to be essentially the same, whether the phimosis be due to narrowness of, or adhesion of, the prepuce. When necessary, the variety of phimosis intended will be especially specified.

In the hope of eliciting discussion, the present report is submitted in the form of propositions.

PROPOSITION I.—*In childhood phimosis is the rule, and may be considered as physiological.*

The frequency of phimosis is a commonly-accepted fact; nearly every writer upon genito-urinary diseases mentions it. Drs. Van Buren and Keyes say: "With very young children, phimosis is so common that it may be considered normal. The foreskin of the child is developed out of all proportion to the rest of the penis, taking the member after puberty as a standard of comparison." There is, however, no occasion for citing authorities. No one, whether giving especial thought to the subject or not, can have failed to observe how rarely the glans is seen uncovered in young children, even when the penis is in a state of erection.

This inability to uncover the glans is frequently due to the length of the prepuce and to the narrowness of its orifice alone. I have satisfied myself of this, in some cases, by passing, without obstruction, a probe beneath the foreskin quite to the sulcus behind the corona and in various directions. Observation too of some cases of so-called "ballooning" of the prepuce, shows that the collection of urine may be sufficient to separate the prepuce entirely from the glans, while

the obstruction at the orifice may be considerable. Notably, I have observed this to be true in the cases of certain adolescents, where a narrow and somewhat tortuous outlet, admitting with difficulty an ordinary probe, rendered micturition slow and difficult. But, as a rule, I think it will be found that adhesions, in the sense of an agglutination of the two epithelial surfaces, exist in phimosis, and that, in most cases, they constitute the real difficulty to be overcome. Any one who has made or witnessed many circumcisions, or other operations upon the foreskin of children, must have observed the frequency of this agglutination, and that it is often so strong as to require considerable force for its breaking up.

Prof. Joh. Bókai (*Jahrbücher für Kinderheilkunde*, Dec. 5, 1871), in a paper on "Die zellige Verklebung (scheinbare Verwachsung) der Vorhaut mit der Eichel mit Knaben," etc., gives the result of his investigations in this connection. He had noticed the frequency of troubles of micturition depending upon phimosis and adhesions, and endeavored to ascertain how frequently the latter existed in children. His conclusion is, that agglutination of the two mucous surfaces is, in general, a physiological condition, which should be considered pathological only under certain circumstances. To justify this conclusion, he gives the result of one hundred examinations of children, from birth to thirteen years of age. For convenience, he divides adhesions into three grades:

1. Adhesions extending from the corona glandis backward.
2. Adhesions beginning at the anterior part of the glans, and running backward.
3. Adhesions reaching from the point of the glans to the sulcus retro-glandaris.

The adhesions varied in degree of firmness as well as in extent, the more extensive being sometimes so close as to cause bleeding when torn off.

Now, of the one hundred children examined by Bókai, all above seven years of age—eight cases in all—were perfectly free from adhesions. Of the ninety-two cases under seven years of age, six were perfectly free. Altogether, then,

| | | | | |
|----|-------|--------|---------|--------------------|
| 14 | cases | showed | no | adhesions. |
| 24 | " | " | the 1st | grade of adhesion. |
| 22 | " | " | the 2d | " " |
| 40 | " | " | the 3d | " " |

The younger the children, the more extensive, as a rule, were the adhesions, and *vice versa*; the freedom of the prepuce increased with the age.

The adhesions occur, too, without reference to the shape of the prepuce or the narrowness of its outlet.

Some time since Drs. Holgate and Bosley, Attending Physicians to the Class of Children's Diseases in the Out-Door Department of Bellevue Hospital, made (at the instance, I think, of Dr. J. Lewis Smith) a large number of examinations of children with reference to this same question. The investigation was prompted, as with Bókai, by the frequency of disorders of micturition in connection with phimosis.

No statistical record of these examinations was made, but, in a conversation with me regarding them, Dr. Holgate stated that he considered phimosis in children to be normal, and estimated that it existed in eighty per cent. of the cases examined. "All cases of phimosis have adhesions." "The narrow outlet is rare" (meaning, I suppose, an outlet so narrow as to entirely prevent retraction of the prepuce), "occurring, perhaps, once in twenty or thirty cases."

Dr. M. J. Moses of this city, in answer to an inquiry from me, says, "Among infants who have been circumcised by me on the 8th day, numbering, by rough estimate, say forty-five or fifty, I found adherent prepuce, I believe, three times The adhesion was directly to the corona of the glans." The disparity between this proportion and that given by the gentlemen above quoted is due probably to different understanding as to what constituted an adhesion, Dr. Moses only including firm adhesions, and throwing out ordinary agglutination.

PROPOSITION II.—*Phimosis, by its unusual severity or persistence, may become pathological, and may give rise to disturbances both local and remote.*

The *local disorders* include (a) *those which are purely mechanical* in their nature: such as interference with the

proper development of the genitals; difficult or intermittent micturition, or even total retention of urine; and retention of secretions beneath the prepuce. (b) *The direct results of the mechanical irritation*, or mechanical obstruction: such as itching of the glans, pain, balanitis, and also, as a result of the straining requisite to void the urine, prolapsus recti or hernia. (c) *Genito-urinary symptoms not directly mechanical*: such as incontinence of urine, vesical irritation or tenesmus, hæmaturia, priapism, and, in adult life, erotic dreams, seminal emissions, painful and unsatisfactory coitus, etc.

The *remote phenomena* are generally disorders of the nervous system, and among the disturbances of this kind that have been referred to phimosis as a cause are gastralgia, neuralgia, amblyopia, reflex paralysis, paresis, incoördination, etc.

To speak of these various classes more in detail:

Interference with the development of the organ caused by tight prepuce is not common, but cases of it have been referred to by writers.

Disorders of micturition, however, dependent upon phimosis, are of very frequent occurrence—so frequent, indeed, as hardly to demand extended comment. The commonest trouble is dysuria, in the forms of difficult expulsion of the urine and of interruption of the flow, the former being the more common. The difficulty sometimes reaches the degree of complete retention. The existence of dysuria is not wonderful, if the length and frequent narrowness of the prepuce, the position of the preputial orifice, the close application of the prepuce to the meatus urinarius, and the collections in or near the latter of secretions, be recollected as so many hinderances that may present themselves to the flow of urine. Still further, dysuria is often seen to depend upon simple agglutinations between the epithelium of the glans and of the prepuce, even when there is no seeming obstruction. Cases to illustrate the various forms of obstructed micturition must present themselves to the recollection of every one present, and there is no need to discuss this group of disorders.

Nearly as frequent are the troubles arising immediately from the irritation of retained urine or smegma. Itching is very common; and so, too, are attacks of balanitis or balano-

posthitis. I have seen cases in which the attacks of balanitis seemed to have produced inflammatory adhesions, in addition to the agglutinations previously existing, thus aggravating the subsequent condition of the parts. Of course, this itching excites in the patient an unconquerable desire to pull at the prepuce, or to rub or scratch the penis; and hence, unfortunately, the vice of masturbation very frequently has its rise.

The great difficulty experienced in voiding urine leads to prolapsus recti, and to hernia, as the direct result of the necessary straining.¹

Of the genito-urinary disturbances not directly mechanical, the most common, by far, are incontinence of urine and priapism. Less common are vesical irritations and hæmaturia. If the phimosis persists to adult life, erotic dreams with the usual concomitant of seminal emissions, and painful or unsatisfactory coitus, are not rare; the latter due, in part at least, to purely mechanical causes.

Incontinence of urine is so commonly dependent upon phimosis, that I have for years been in the habit of correcting the latter, if it exist, before trying other treatment, whenever I have been consulted for incontinence of urine in boys. Priapism, too, is a very frequent and often a striking symptom. I have in mind cases in which it was the main reason why the child was brought to my notice by the mother, the accompanying dysuria not having been considered of sufficient importance. Vesical irritation is not rare. Hæmaturia is less frequently observed. Of the additional symptoms mentioned as obtaining in adult life, it hardly need be said that the phimosis, by its irritation of the glans, naturally increases the tendency to erotic symptoms. So, too, by the increased sensitiveness of the organ, and by the mechanical interference with intromission, coitus may be rendered both painful and difficult. I have seen a middle-aged married man, to whom coitus had become a matter of difficulty from adhesions (probably due to a balanitis) of the prepuce to the posterior third or half of the glans, the anterior part being freely uncovered.

When the intimate connection between disorders of the

¹ In a similar manner I have seen hernia produced in an elderly man suffering from enlargement of the prostate.

generative organs and those of the nervous system is recollected, we should naturally look to find the latter dependent upon a condition which, like phimosis, we have already seen to be the exciting cause of much local irritation.

The earliest references to such a cause for nervous disarrangements, that I have met with, are in Dr. Bumstead's well-known work on "Venereal Diseases." These references are to articles in the *Gazette des Hôpitaux* and *Revue de Thérapeutique Medico-Chirurgicale*, by Fleury, Borelli, and Anagnostaxis, the neuroses specified being gastralgia, neuralgia, and amblyopia. I regret that I have been unable to find in this city files of these journals of so early a date (1850 and 1851), and that I can therefore give no further account of the cases there presented.

Within a few years, however, several articles have appeared upon reflex irritations from the genital or genito-urinary organs. Dr. Sayre, at the meeting of the American Medical Association in 1870, presented a paper upon "Partial Paralysis from Reflex Irritation, caused by Congenital Phimosis and Adherent Prepuce." In this paper are recited three cases. The first, occurring in a child five years of age, was one of paresis of the extensor muscles of the thigh. The co-existence of phimosis with great irritation of the prepuce, priapism, and an orgasmic condition, led Dr. Sayre to suspect that the paresis was dependent upon the local excitation. Circumcision was accordingly done. The child's general condition was at once relieved, and within a fortnight he recovered the power of walking without assistance. The second case was one of phimosis in a lad of fourteen, who also suffered from "paralysis of his legs." Circumcision relieved the symptoms, which had previously resisted the ordinary appropriate methods of treatment. The third case was in a lad of fifteen. He presented for symptoms, neuralgia, weakness of the legs, and "falling fits," "because his legs would not hold him up." He complained, moreover, of being "troubled every night with *painful* erections and frequent emissions," but denied masturbation. Circumcision was likewise followed in this case by immediate improvement; the nocturnal disturbances ceased, or nearly, and the "fits" also. It is not quite evident whether

the "fits" mentioned in this case were of a convulsive nature, or were some less violent expression of disturbed co-ordination. In addition, Dr. Sayre expresses his belief that the existence of phimosis, by its disturbance of the coördination, may be an exciting cause of hip-disease, through the frequent falls to which the patient is subject.

In the NEW YORK MEDICAL JOURNAL for October, 1871, Dr. M. J. Moses published an article on the "Value of Circumcision as a Hygienic and Therapeutic Measure," and in it relates a case of convulsion and "nervousness" relieved by circumcision. A second case of "absolute melancholia" was cured in the same way.

In a paper read before this Academy, February 19, 1874, Dr. F. N. Otis related a large number of cases illustrating "reflex irritations throughout the genito-urinary tract, resulting from contraction of the urethra at or near the meatus urinarius." Preliminary to these he recited a case, treated by Dr. Brown-Séquard, in which an apparent cerebral *ramollissement* was cured by circumcision.

A second paper of Dr. Sayre's ("Transactions of the American Medical Association," 1875) presents some further cases. The first was one of spasmodic contraction of the adductors and flexors of the upper and lower extremities, and a state of "ecstasy" with priapism. The symptoms were quite violent, and appear to have been distinctly orgasmic. It does not appear whether any form of masturbation was observed as exciting the "ecstasy." Quite firm adhesion of the prepuce to the glans existed, as well as a narrow orifice of the foreskin. The prepuce was split, and torn from the glans. Speedy amelioration of symptoms followed the operation. The second case was one of paresis of the lower extremities, especially of the left leg, with atrophy. Improvement was rapid after circumcision. The eighth case is interesting: A case of double varo-equinus, that had undergone considerable instrumental treatment, was materially relieved by circumcision; the talipes being of a paralytic nature, and dependent, in Dr. Sayre's opinion, upon a phimosis, which caused considerable local disturbance. Appended to the last-named paper are some cases cited by Dr. Otis from his own practice and that of other gen-

tlemen. They illustrate retention of urine with partial paraplegia, incontinence with paraplegia, enuresis with hebetude, all relieved by removing the phimosis.

Still further, Dr. James S. Green contributes to Dr. Sayre's paper a striking case of "hyperæsthesia of the skin over the whole body, very marked want of coördination of motion in the arms and hands, and great difficulty in walking." The case grew worse for three years in spite of treatment. Circumcision was followed by relief of the hyperæsthesia within a few hours, "and in forty-eight hours (he) had recovered entirely the use of his limbs."

The following history of a case, which I saw through the courtesy of Dr. Sayre, shows the most frequent variety of disturbance of locomotion associated with phimosis:

CASE I.—*March 16, 1877.*—Laurence Nelson McKee, aged seventeen and a half months. (Colored.) The child was brought to Dr. L. H. Sayre because of his inability to walk. The mother gave the following history: The child never had walked; had made few efforts to do so. She thought the left side seemed to be paralyzed; when she "walked him along" his left lower extremity dragged. The left hand was constantly clinched, and could be opened with difficulty. He has had no difficulty in micturition, no incontinence of urine. The mother has noticed, however, a tendency on the child's part to play with his privates, and also that the penis was frequently erect, perhaps half the time. The child has phimosis; aperture of prepuce very small. Prepuce split up by Dr. L. H. Sayre, and found to be adherent up to the meatus. It was worked off from the glans by means of a scalpel-handle. A considerable collection of smegma was removed. The frenum was also cut.

21st.—Mother reports that the night after the operation she observed the child to attempt to stand alone. Within the five days that have elapsed the mother states that he has improved in his speech. The left hand is opened more readily, the rigidity of the fingers is gone, and he begins to use the hand freely, which he never did before the operation. The dragging of the foot is much better, and that member is put out nearly as freely as is the other.

A month later I saw the child. The mother reports him as still improving in his gait.

Dr. Green has sent me the notes of several cases besides the one above cited. Some of these are particularly interesting, on account of the long duration of the symptoms, the age of the patients, as well as the results of treatment. Here follow some of the more striking cases:

CASE II.—T. S. H., aged forty-two years. Has always been troubled with pains in head, back, and limbs. Since 1858 has been subject to slight epileptic convulsions. Has been losing his memory gradually. Is constantly in a state of nervous irritability; despondent, and has a suicidal tendency. Has been troubled with spermatorrhœa. I found the prepuce adherent and contracted. A probe passed into preputial orifice only to the depth of three-eighths of an inch. Operation of circumcision performed. Six weeks after operation reports himself as follows: "I am a new man; no headache; no spasms; memory improved; am calm, and my judgment in business was never so clear. In fact, I do not remember I was ever so well."

CASE III.—C. S., aged thirty-three years. Literary gentleman. Has suffered for ten years with spermatorrhœa. Headache, fugitive pains in the back and limbs, with acute hyperæsthesia of the skin, and gradual loss of power in his right leg. He was morose, despondent. Testicles sensitive. Spasm of the sphincter vesicæ; frequent retention of urine. Prepuce adherent. Circumcision performed. Two months after operation he writes: "All my symptoms are relieved to my entire satisfaction."

CASE IV.—J. C., aged thirty years. Machinist. Has been losing his sight for two years, so that it is difficult for him to pursue his business. He is despondent, abstracted, and at times, when hurried to answer a question, troubled with aphasia. Has had his eyes examined in New York. His difficulty pronounced to be atrophy of the optic nerves.

Examined penis; found in a constant state of semi-erection. The prepuce could be retracted, but formed a tight constricting band behind the corona.

The meatus urinarius was very small. Circumcision, and slitting up of meatus to receive number twenty-five English sound performed. Three months after operation his sight, speech, and mental symptoms vastly improved.

CASE V.—F. B., aged eighteen years. Has suffered from spasms of all the flexor muscles of the right side, and want of coördination from birth. Having been treated by a number of eminent neurologists for several years without any relief, he gave up all hope, and was laid aside to live out as well as he could the rest of his existence. Being anxious to try the effect of circumcision upon him, Dr. Sayre, who had seen him ten years previously, was called in consultation. Circumcision was advised and performed. Subsequently I divided the adductors of the thigh on either side, and the ham-string muscles of the right side, and now he walks with very little difficulty with a cane. Previous to the circumcision he could not maintain the upright position without support, nor even turn himself in bed. He had also always had spasm of the sphincter vesicæ, which was relieved by the operation.

Dr. Green remarks, in conclusion: "These are a few of the cases of adherent prepuce upon which I have operated. Hav-

ing performed the operation for nervous disorders in thirty-four instances—in all but one with satisfactory results—I am satisfied that failure, in many instances, arises from the imperfect manner in which the operation is done, and want of care in the subsequent dressing. In some of the cases the relief was almost miraculous, and I refrain from the recital lest my veracity be questioned by the incredulous members of the profession. However, it is not more incredible that circumcision should produce such results, than that a punctured wound should give rise to tetanus, or that the replacement and fixation of a displaced uterus should relieve all the nervous symptoms of an hysterical woman.”

To the *American Journal of Medical Sciences* for October, 1876, Dr. A. McL. Hamilton contributes an article on “Nervous Disturbances dependent upon Various Forms of Genital Irritation.” The article contains an interesting discussion of the neuro-physiology and neuro-pathology of this class of cases, but the examples cited present no symptoms not shown by the cases already quoted. The same comment will apply to the occasional cases that have appeared in the medical journals, and that have come under my notice.

The forms of nervous disturbance observed in these cases, so far as I have ascertained, have been, notably, incoördination of muscular movements, including those necessary to speech, less commonly spasm or spastic contraction, and paresis, generally of the lower extremities. I find no case of paralysis of sensation, but hyperæsthesia is often mentioned. Several cases of amblyopia have been published. A mental condition resembling hysteria or hypochondriasis is a frequent element in the clinical histories.

Of course, in such an assemblage of cases none should be admitted for which other known causes of the nervous disorder may be found to exist, at least unless the relief of the phimosis was followed by marked and speedy amelioration of the symptoms. Another point, more difficult of determination, must be whether, in a given case, the neurosis depended upon the phimosis *per se*, or, as Dr. Jacobi suggests, upon “the habit of masturbation, so easily contracted when the phimosis is marked enough to prove an annoyance and irritation, and

frequently given up when the source of constant irritation has been removed."

It is not claimed that cases of reflex disturbances remote from the genito-urinary organs are very frequent, but simply that, setting aside the cases that are for the reasons stated doubtful, there remain a sufficiently large number to give phimosis a place as a recognized cause of neuroses, and one which should not be overlooked in making out the etiology of a given case. It is only fair to consider cases where relief of the phimosis alone has been followed by immediate cessation of the nervous symptoms, as evidence of the dependence of the latter upon the former condition.

Beyond this, however, we may safely go. Wherever there is marked irritation of the genitals with phimosis, even if we do not believe the condition of the prepuce to be the sole or main cause of the coexisting neurosis—where, indeed, we feel sure that the nervous manifestation, or the intellectual deficiency, is due to causes beyond our reach—we may safely assume that the relief of the phimosis will be productive of benefit. The removal of a source of irritation will probably be followed by the subsidence of such aggravation of the prime trouble as was due to this local cause, and the prompting to masturbation—a vice notably common among those whose mental or moral vigor is already impaired—much diminished.

It should be mentioned, that the amount of remote nervous disturbance is by no means proportionate to the apparent local irritation. A case occurs to my recollection bearing upon this point: W. W., aged eleven months; already able to run about easily, showing no locomotory disturbance; intelligence good; "a forward child," in speech and otherwise. His mother, uncovering him as he slept, called my attention to his priapism. The penis was very large and exceedingly rigid—"healthy," as the mother expressed it. She complained, however, that the child was constantly playing with his privates, and added, "I am not sure that the *bonne* does not help him sometimes." This priapism was said to be nearly constant, sleeping or waking. Further inquiry elicited the facts that he was restless in sleep; micturition was tardy, and accomplished, as a rule, only with considerable encouragement

from his attendants. Circumcision relieved all the local symptoms, and gave the child quieter sleep directly after the operation.

A word only is needed with reference to treatment. Simple breaking up of adhesions, the forcible retraction of the prepuce with or without its division, divulsion of the preputial orifice, and complete circumcision, are the various methods that have been employed. Bókai, who only interferes if there be pathological symptoms, relies solely upon retraction, breaking up the adhesions with a probe or other suitable instrument. Inflation of the prepuce with water forced from a syringe is recommended for the same purpose. Dr. Holgate informs me that in all his cases—a great number—he has found forcible retraction sufficient. The glans, after being cleaned of smegma, is anointed, and the prepuce again brought forward. In this he agrees exactly with Bókai. This manœuvre is repeated by the surgeon, if necessary, and the attendant in any event directed to repeat it daily. One instance he mentioned of recurrence twice of the enuresis, owing to the agglutinations having been allowed to reëstablish themselves. In such a case circumcision will probably make a complete cure.

If the prepuce be redundant, the circumcision is the preferable operation; if not, splitting of the prepuce, if necessary, may be done to assist its retraction. In adolescents, or in children, where the prepuce has been the seat of much inflammatory process, the knife will be generally needed in one method or the other.

Dr. Sayre urges, as does Dr. Green in his comment upon the cases above cited, the necessity of circumcision, and of doing it thoroughly, watching carefully for constricting bands of mucous membrane, and nicking them if they exist, dividing also the frenum if it be short, etc.

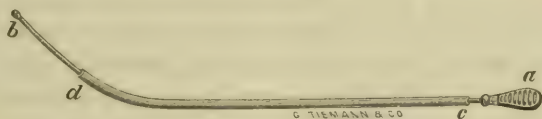
[In the discussion upon the foregoing paper, Dr. F. N. Otis cited certain cases of spermatorrhœa and mental disorder depending upon an unusually long prepuce, although no phimosis existed. The symptoms disappeared upon ablation of the foreskin. Dr. Otis was inclined to attribute the disturbances to the constant "poulticing," so to speak, of the glans by this redundant prepuce.]

ART. IV.—*A New Uterine Applicator.* By H. C. TURNER, M. D., Class of Diseases of Women, Southern Dispensary and Hospital, Brooklyn, L. I.

MY excuse for offering to the notice of the profession a new instrument is that, after searching the catalogues of different instrument-makers in vain for something to accomplish my purpose, I was obliged to have constructed the instrument which is the subject of this paper; and finding it to answer excellently well the purpose for which it was designed, I have ventured to detail a few cases, to illustrate the advantages which it affords in making intra-uterine applications.

That there are serious objections to the use of the syringe in making applications to the fundus uteri in ordinary gynecological practice is, I think, conceded by a great majority of the profession; and in the application of the agent by means of cotton wrapped on a probe, the objections are, that the cotton loses its charge before it has penetrated far, if indeed it does not excite contractions which prevent its reaching the cavity at all.

The applicator, as figured in the cut, consists of two parts, a hard-rubber tube, *c d*, the size of a number seven catheter, English scale, which carries a whalebone rod, *a b*,



extending two and a half inches beyond its extremity, represented by the space *d b*. This rod is flattened from *d* to *b*, and terminates, like a probe, in a slight bulbous enlargement. The manner of using it will be shown in the recital of the following cases:

The first case in which it was used was one of membranous dysmenorrhœa, which had resisted treatment for several months. Mrs. S., married about three years, came to my office very much reduced by uterine disease. She stated that about two months after marriage she was taken with profuse flooding, accompanied by severe pains; that the doctor had taken some-

thing away with instruments, and that since that time she had been suffering from uterine disease. I found chronic inflammation of the whole organ, with great engorgement. After the usual topical treatment, accompanied by tonics, ergot, conium, etc., the patient regained health and spirits; the uterus regained a healthy appearance, the length of cavity was but slightly more than normal, position of organ about natural. However, a few months after, about the last of July or first of August, 1875, she returned, saying that she had never been rid of expulsive pains at each menstrual period, which would continue for a day or two, when a membranous substance would pass, and menstruation would be easier. On thinking the case over I came to the conclusion that I would have to make thorough applications to the fundus uteri. I was afraid of the syringe, especially as the cervical canal was narrow and constricted. I therefore hunted for an instrument to accomplish my purpose, but, finding none, Messrs. Tiemann & Co. made for me the instrument described above. In using it the whalebone rod is run through the tube, and cotton wrapped firmly around the protruding end from the bulbous extremity far enough to correspond to the surface to which the application is to be made. When the cotton is thoroughly saturated, the rod is drawn back until its bulbous end is concealed within the tube. The tube is then wiped free from any of the agent used, lubricated and passed to the fundus, or as far as desired; the rod then being carefully held in position, the tube is withdrawn over it, leaving two and a half inches, the normal length of the cavity of the healthy uterus, uncovered, and the agent applied to the whole of the diseased surface, instead of being almost, or, in many cases, entirely lost before reaching the spot for which it was intended. In a comparatively short time the dysmenorrhœa was cured, and menstruation took place naturally.

The recital of one more case will illustrate its value in metrorrhagia. Mrs. K., aged about forty years, had suffered from uterine disease for a long time, and had been treated for nearly a year topically before coming under my care. She had been losing blood pretty steadily for about three weeks before she submitted to examination, and for some time her

menstruation had been profuse and irregular. On examination, I found the womb anteverted and enlarged, from chronic inflammation, and blood oozing steadily from the os. Wrapping the rod with cotton, as before described, I charged it fully with a solution of iodine, carefully passed the instrument to the fundus, and slid the tube back over the rod until stopped by the handle, leaving two and a half inches of application. Leaving it *in situ* for about a minute, I withdrew it, removed the extra iodine by means of cotton and dressing forceps, and found the oozing had ceased. I continued the applications for the engorged condition, and in six months discharged her cured. Before her discharge she menstruated regularly and naturally, had no leucorrhœa, and the position of the organ was natural.

I would say that the first case of membranous dysmenorrhœa was discharged cured over a year ago, and there has been no relapse; the other has been since the middle of March last without any return. Sometimes it will be necessary to introduce a small sea-tangle tent before the use of the instrument, but it will very rarely need to be repeated; indeed, the tube itself acts as a dilator, and often accomplishes good results merely by its passage. If there is spasmodic resistance to its passage it may be overcome by holding the tube with *very slight* pressure against the stricture, until it is tired out and relaxes. I have now used the applicator for considerably more than a year, and have had results fully sustaining the conclusions arrived at in the consideration of the above cases, and which I am satisfied could not have been obtained as safely, surely, or with as little manipulation, without it. The testimony of other practitioners is to the same effect.

It seems to me that the instrument has at least these advantages:

1. That a sufficient quantity of an agent may be put just where you wish it, without injecting it as with a syringe, thereby avoiding its dangers and reaping all its advantages.

2. You do not see by its use intra-uterine applications followed by days of pain and hæmorrhage, as is often the case with the syringe, unless, indeed, there has been gross carelessness on the part of the patient.

3. The application can be made to any spot where it is desired, or to the whole length of the uterine cavity, and in cervicitis and other troubles the mere passage of the smooth rubber tube is beneficial.

The materials used in the construction of the instrument I prefer to metal, for the following reasons: 1. They are not acted upon by any of the agents likely to be used, and therefore the instrument is more readily kept clean, and the interior of the tube retains its smooth, polished surface, allowing of its free sliding over the cotton-wrapped rod. 2. A smooth, polished rubber tube is easier of introduction than metal, and by dipping it into boiling water, or heating it over a spirit-lamp, its curve can easily be altered as desired, without damage to its calibre.

The flattened form of the rod is necessary for the firm and even wrapping of the cotton, and to avoid pushing it off, or bunching it up, before the advancing tube. A pair of sharp-pointed scissors will easily and speedily remove the cotton.

Translations.

The Hereditary Transmission of Syphilis. By Dr. M. KASSOWITZ, Attending Physician to the General Hospital for Children, Vienna. 1876. Translated for the NEW YORK MEDICAL JOURNAL by Milo A. Wilson, M. D., Clinical Assistant to Professor of Dermatology, Bellevue Hospital Medical College; late Attending Physician to New York, Northwestern, and Bellevue Dispensaries; Member of County Medical Society; Assistant Surgeon Seventh Regiment, N. G. S. N. Y., etc., etc.

(Continued from July Number.)

V. *Can the Mother, acquiring Syphilis during the Period of her Pregnancy, transmit the Disease to a Fetus, healthy at the Time of Fecundation?*—This mode of the transmission of syphilis is accepted by the majority of authors, but almost exclusively for the reason that they regard it simply as being

self-evident and well known. The one always refers to the other, and only exceptionally does any one consider it worth the trouble to produce his individual exact observations relative to this assertion, to which, usually, no great importance is attached.

But just this question is one of exceeding importance, for upon the answer depends the definite decision as to whether the inheritance of syphilis takes place only at the time of conception, or whether it may also be communicated through the placental circulation. Consequently, I have given my special attention to this question from the very beginning, and have taken the trouble to subject to a close investigation all positive observations reported upon the subject. The result, however, is not at all favorable to this mode of transmission from the mother to the child.

It is above all very surprising, that even those writers who consider such a transmission as possible do not recognize its occurrence in all cases. Such a transmission is really only conceivable in this way: that the syphilitic virus contained in the blood of the mother is conveyed through the placental circulation into the vascular system of the child, and there again creates syphilis. We should therefore suppose that every pregnant woman, who suffers from recent syphilis during any period of her pregnancy, would also inoculate the foetus; for, during this period, we must necessarily consider her entire blood-mass to be saturated with the syphilitic virus. But we find, now, that all writers, with but few exceptions, believe this transmission to take place only during certain months of pregnancy, and in the remaining months the child is exempt; in which opinion, as we shall see later, they do not at all harmonize with each other in the determination of these different periods. Thence follows, undoubtedly, but one fact, viz., that almost all these authors have seen mothers who have suffered from recent syphilis, acquired during the period of pregnancy, give birth also to healthy children. As we shall prove from many individual and foreign observations, the last case is placed beyond a doubt; and there being no possibility of error in regard to this, for the reason that the two factors necessary for proof—namely, the recent syphilis of the mother

and the immunity of the child—are in general quite readily shown, a doubt, therefore, as to the correctness of the other observations obtrudes itself at once, in which a foetus, healthy from the time of conception, should during its intra-uterine development acquire syphilis from its mother, who since that time had become diseased.

Exactly in these cases the greatest scope is given for error and deception. That the theory of such a transmission to the originally healthy foetus may be rendered valuable in a scientific way, the following three conditions are indispensable:

1. The health of the father at the time of the fecundation must be proven.

2. The health of the mother at the time of conception must be established, consequently the time of her inoculation exactly determined upon. This last is only possible when either the primary lesion itself, during the course of pregnancy, or at least the first outbreak of constitutional symptoms, has been seen by the observer.

3. The syphilis of the child must be proven by unequivocal symptoms. A premature birth, intra-uterine death, great debility at the time of birth, an early death without a previous outbreak of syphilitic symptoms, are by no means sufficient for considering the foetus to be syphilitic.

If but a single one of these conditions is wanting, the case is not to be relied upon. If even the infection of the mother after conception is proven, and the child undoubtedly is congenitally syphilitic, the history of the father being unknown, it is very natural to suppose an inheritance from a syphilitic father at the time of fecundation; to whom also, very probably, the subsequent inoculation of the mother must be attributed. Or, if a woman suffering from constitutional syphilis comes under observation for the first time at the end of pregnancy, or even only after confinement, and asserts then that she became ill in the third or fourth month of pregnancy, it proves in no way her immunity at the time of conception. It is well known, apart from willful deception, how often women overlook the primary lesion, or even the eruption of *roseola syphilitica*, and only date the period of their disease from the time when the condylomatous growth of papules in

the vicinity of the genitals began to be a source of serious annoyance. Here it must also be stated, that in cases of the last category the father is almost always unknown. If, finally, a woman with recent syphilis, originating, according to her statement, during pregnancy, aborts prematurely, or bears a still-born child, in which, even upon the closest examination, no signs of syphilis are perceptible; or if, again, she gives birth to a weak but living premature child, which presents no evidences of syphilitic disease either during its life or after death, we may, in such a case, say that the freshly-developing or the florid general syphilis of the mother was the cause of the abortion, the premature birth, and the intra-uterine death of the fœtus; that here the maternal syphilis acted like other deeply-seated disease processes in the mother, such as typhus, cholera, or, indeed, even lighter diseases, preceded by eruptive fevers. But from all this alone, if the disease is not positively proven in the fœtus, we can by no means come to any decision relative to a transmission of the syphilis to the child.

If, with these restrictions, we now proceed to prove those cases which claim to show the transmission of syphilis from the mother to the fœtus healthy at the time of conception, we find that, in all the varied and extensive literature upon syphilis and inherited syphilis, there is not a single well-proven case, or, indeed, an isolated one, which according to these conditions is even probable. I find no case in which a child, both of whose parents were healthy at the time of conception, had itself inherited syphilis in general, or even a disease with the characteristic appearances of hereditary syphilis, merely in consequence of the disease having been acquired by its mother during pregnancy.

Nevertheless, we must undertake the ungrateful task, at least in part, of placing in review the many contradictory opinions and observations of writers.

As we have learned in the introduction, after Augier Ferrierus in the sixteenth century, and Astruc in the eighteenth, had already spoken of the inoculation of a fœtus by the diseased secretions of the mother, as opposed to that of heredity through the semen, we find the first more definitely-expressed

views upon this mode of transmission by Mahon (*l. c.*), who asserts that only children born prematurely, with shrivelled skin and dry, scaly epidermis, denote inoculation at the time of fecundation; while those poisoned by the secretions of a mother diseased during pregnancy only present the first signs of syphilis after birth. The incorrectness of this view is at once apparent; for, according to this, always only the first child could be affected in the last-mentioned manner, and those born later must always be premature; while, as is well known, the reverse condition forms the rule.

The following cases are given by Bertin (*l. c.*):

A woman noticed, during the middle of her pregnancy, nodular growths about the genitals. In the sixth month (consequently, four to six weeks after the appearance of these growths) the birth of a still-born child took place. Here the condition of the father is unknown, the syphilis of the child not proven.

Three and a half months after conception a woman had a chancre, and ulcers upon the tonsils. The child, three weeks after birth, showed ulcers *ad nates*.

Again, the condition of the father is unknown; the infection of the mother is to be dated earlier, because already in the fourth month she had presented marked symptoms of general syphilis.

In the sixth week of pregnancy a woman had pustules upon the labia majora, and aborted at four and a half months. Here also the father is unknown, the syphilis of the fœtus unproven.

Starck (1851) relates the following, as a case of inoculation of the fœtus during pregnancy:

In a girl four months pregnant he himself observed a primary ulcer, which was healed in the seventh month. A child was born at term, with symptoms of hereditary syphilis.

Here, upon the one hand, everything in relation to the father is wanting, and, upon the other, nothing whatever is said of general syphilis in the mother. The disease was probably inherited from the father, while the mother suffered simply from a chancroidal ulcer.

Diday (*l. c.*) regards this infection of the fœtus from a sub-

sequent diseased mother to be so certain, that he intentionally omits the publication of cases bearing upon the question. He constructs the following theory in relation to the time when syphilis can be communicated to the fœtus: Syphilis acquired during the first forty days of pregnancy is not transmitted to the fœtus, because at this time the ovum still nourishes itself independently (?).¹ During the last months of pregnancy the fœtus becomes again more independent, and the child therefore remains likewise spared, if during this indefinite period the maternal diathesis is first developed. Only syphilis appearing in the mother during the middle months of pregnancy is transmitted to the child. In addition to this, he remarks decidedly that syphilis communicated to the child in this manner can be distinguished in no way from that inherited from the father. The worthlessness of such theories, having no foundation whatever, is at once apparent.

Rosen (*l. c.*) likewise succeeded in constructing equally untenable theories in regard to the influence upon the fœtus of syphilis acquired by the mother during pregnancy. He holds the fœtus as not yet susceptible to the virus within the first three months. In the third to the fourth month, when the vascular interchange is already active, the fœtus is still too weak, on account of which it is thrown off as an abortion, dead but not syphilitic. Only a fœtus in the second half of pregnancy, when fully capable of life, is infected by the mother. His observations are about as follows:

Several months *before* conception the mother had a chancre; within the first months of pregnancy secondary syphilis; at the ninth month, the birth of a syphilitic child. (Case LXII.) The father was evidently syphilitic, the mother also, probably, at the time of conception.

Neither in the remaining cases, apart from the want of information in regard to the father, is syphilis proven in the fœtus; they are, it is true, born dead, but present no specific lesions.

Oewre (*l. c.*), who in a consistent manner acknowledges this mode of infection (quite like Cullerier) throughout the whole

¹ Does the mother after this time again cease to be syphilitic?

period of pregnancy, brings herewith an extensive material under observation. But this material does not in any way meet our demands. Of his forty-three cases—which are, however, almost exclusively not founded upon his own observations, but are taken from old histories of diseases—not one is in such a condition as to prove anything whatever. In thirty-one cases, absolutely every statement in regard to the father is wanting; and in five cases he says positively that the father, at the time of the procreation of the child, was constitutionally syphilitic. In all the cases it is only shown, as regards the mother, that at the time of her confinement she was suffering from syphilis (in three cases even only with the primary lesion), but only in thirteen cases is it asserted that the inoculation really took place during pregnancy, since the primary lesion, or the outbreak of the first general symptoms, were then observed. In the great majority of cases the women were admitted only shortly before labor, in several cases even afterward—indeed, several months later—and their statement that they became ill in such and such a month of pregnancy was simply made a note of. These data, therefore, are entirely unreliable. It is not much better in relation to the hereditary syphilis of the children. Only seventeen of the forty-three had really presented symptoms of syphilis; six fœtuses were born dead and decomposed, and were not dissected; twice a premature abortion resulted. All the remaining children lived for hours, days, and weeks—some, indeed, for two and a half months—without suffering from syphilis, and died with various diseases in no way connected with it. In several, the autopsy revealed the absence of every specific lesion. These cases of Oewre's run about as follows:

The mother was inoculated in the beginning of the second half of pregnancy. In the ninth month a child was born, which died in twenty days. The *post mortem* revealed catarrhal pneumonia and pulmonary atelektasis. (Case LII.)

The primary lesion in the mother was noticed in the eighth month, the outbreak of general symptoms before labor; the birth of an apparently healthy boy, weighing five and five-eighths pounds, who fell ill when ten days old with vomiting and diarrhœa, and died when two weeks old. An autopsy

showed general atrophy, atelektasis, and hæmorrhagic infarctions in the lungs and kidneys. (Case LIX.)

The mother, admitted when seven months pregnant, inoculated two months previously. A healthy child was born, which died when one month old, with vomiting and convulsions. (Case LX.)

In the ninth month the mother gave evidence of recent secondary syphilis. A mature child was born, weighing ten pounds, which died atrophied when eight weeks old. (Case LXIII.)

These are the most prominent of the twenty-eight cases, in all of which the syphilis of the children is entirely unproven. Why Oewre mentions them as supporting his view, is not clear. They only confirm the fact, in our estimation, that women positively suffering from recent syphilis acquired during pregnancy give birth to non-syphilitic children.

Finally, Lewin (1873) relates that a girl, who was impregnated by her *fiancé*, first observed a "pock" in the seventh month on the underlip, which left an induration. A premature birth resulted, and the foetus showed gummy orchitis, spots and ulcers upon the skin. Lewin concludes, from this case, "that children whose mothers are inoculated during the last months of pregnancy may inherit the disease." But in this case at least six to eight weeks must have elapsed between the appearance of the primary lesion in the mother and the birth of the child; and as the foetus gave evidence of already developed gummata, the foetal syphilis must have developed, as a consequence, earlier than the general symptoms in the mother. She stated, further, that her intended had suffered from sore lips a long time previous to her own inoculation; and it is scarcely to be doubted that in this case the syphilis of the father existed already at the time of conception, and was transmitted to the foetus.

The result of our critical study of the observations published by authors, and founded upon fact, is, then, to the effect that the transmission of syphilis from the mother to the child during pregnancy is not proven in any single case. Much more rather we have as evidence, as well from our own ex-

perience as also from the numerous reports of other writers, the fact that, in all those cases in which the health of *both* parents at the time of conception is undoubted, there is born every time either a living non-syphilitic child, or, if the pregnancy is interrupted by the outbreak of general syphilis in the mother, there results an abortion or a premature birth, in which the objective condition presented is a negative one, and therefore we are not entitled to suppose the existence of an inherited syphilis.

CASE XI. *Mother inoculated in the Second Month of Pregnancy; Birth of a healthy Child; Subsequent Children syphilitic.*—The father aged at present thirty-one, and the mother forty-one years, have been married since 1866.

1. 1867.—A boy, always healthy, now nine years old. In 1868, at the beginning of his wife's second pregnancy, the man contracted an ulcer upon the penis, inoculating his wife immediately toward the end of the second month, so that in the fourth month the genitals were covered with flat condylo-mata, and ulcers had appeared in the throat. The man also, at this time, had a general exanthema, and suffered from persistent enlargement of the inguinal glands. The attending physician, who subsequently confirmed fully the communications made to me by the pair, treated the man with pills of corros. sublimat., the woman only locally. At the end of the usual period of pregnancy she gave birth,

2. 1869, to a healthy boy at term, who at first thrived very well upon exclusively artificial diet. When four months old he suffered from dyspepsia, and died at five months, without having presented any signs whatever of a syphilitic disease.

3. 1870.—A stillborn female child at eight months.

4. 1873.—In the middle of the ninth month a boy, still-born.

5. *September, 1874.*—A living boy at term. During the first days of life there was tumefaction of the nasal mucous membrane; at the end of the third week a pronounced maculo-papular exanthema, diffuse syphilitic infiltration of the skin of the face, the palms of the hands, and the soles of the feet. Several days afterward there set in a painful swelling about the epiphyseal connection of the heads of the humerus

of both sides, and also of the epiphyses of the left lower arm, occasioning a form of lameness of both upper extremities. In consequence of a continued treatment with protiodide of mercury, all the symptoms disappeared, relapsing frequently.

This case leaves nothing to be desired as to clearness. The first child is healthy. At the procreation of the second child both parents are still healthy, but shortly afterward they both contract syphilis, and the outbreak of general symptoms in the pregnant mother takes place in the fourth month. Nevertheless, the foetus remains free from the disease, for the reason that it originates from a non-syphilitic semen and ovum. The children born later, because procreated by syphilitic parents, are, without exception, diseased, the intensity of the disease becoming gradually more subdued.

In following up the fate of the children born of syphilitic mothers in the lying-in hospital of this city, and, further still, in the foundling asylum, I succeeded likewise, in a large number of cases, in proving the immunity of the children whose mothers were suffering from recent syphilis. I must remark, in connection with this, that the birth of a healthy child from a mother with recent syphilis, making its appearance during the last months, is an event of remarkably frequent occurrence. Unfortunately, the mortality among foundlings in general, and especially among the children just mentioned, within the first weeks of life, is very large; more particularly in consequence of the existing regulation, that all children whose mothers suffer from syphilis are not given to them to nurse, but are removed immediately to the foundling asylum, and kept under observation. Of thirty-seven living children, born for the most part at term, whose mothers at the time of labor were suffering from quite recent forms of syphilis, and, in accordance with the unanimity of the conditions found, with the history, were with the greatest probability inoculated during pregnancy, twelve died in two weeks, seven in four weeks, six in the course of the second month, and three in the third—all of whom presented no signs whatever of syphilis, but died, for the most part, from symptoms of intestinal catarrh and dyspepsia. Seven of these children, after having been under observation for three months in the foundling asylum, were

put out to board, entirely healthy, or else restored to their mothers.

When we see, as we shall later, that in the viable children with hereditary syphilis observed by us, the complete outbreak of the exanthema (apart from the prodromic appearances, coryza, etc., usually already present) occurs in 53 per cent. of all cases in the first month, in 32 per cent. in the second, and only in 15 per cent. in the third, and that we have never observed the first outbreak after the lapse of the third month, it must be admitted that not only the seven children who remained healthy are to be regarded as non-syphilitic, but also at least the large majority of those who died in the second and third months. In most of these last cases, also, the negative condition found upon *post mortem* deserves to be taken into consideration. Several of these cases are given here briefly:

Therese S., born February 12, 1875, weight five and a half pounds. The mother, according to her own statement, had lesions upon the genitals in August, 1874, when three months pregnant, and in October had a macular eruption over the whole body. Immediately after labor she suffered from a general papular syphilide, which in June, 1875, was almost healed. The child was under observation in the foundling asylum until May 15th, and dismissed entirely healthy at the age of three months.

Franz W., born December 11, 1874, weight five and three-quarter pounds. The mother, several days after confinement, having been admitted to the department of Prof. von Sigmund, had confluent papules upon the genitals, which, according to her statement, made their first appearance three months before labor. This would seem to indicate an infection about the middle of pregnancy. The child remained for three months in the asylum, without evidences of syphilis, and was then given out to nurse.

Elizabeth Z., born April 2, 1875, weight six pounds. One year and a half previously her mother had given birth to a healthy child. Three weeks before confinement she was received into the division of Prof. Zeissl, presenting recent papules. The inoculation, as stated by her, dated eight to ten

weeks back, this corresponding to the condition presented, consequently taking place at the middle of the sixth month of pregnancy. The child, upon its admission to the foundling asylum, and still later, was in a normal condition, and after four weeks was returned to its mother. It has since remained entirely healthy.

Magdalene H., born February 18, 1875, weight five and a quarter pounds. Shortly after confinement the mother was admitted to the division of Prof. von Sigmund, with papules upon the genitals, and upon the roof of the mouth; also defluvium capillorum. She dated her inoculation from the fifth month of pregnancy, and the outbreak of the eruption from the seventh. The child lived for six weeks, and died in the asylum from intestinal catarrh. No suspicious symptoms whatever could be discovered, either during life or at the carefully-made *post-mortem* examination.

These observations of mine are confirmed in a very acceptable manner by numerous reports founded upon facts, and cases objectively described by other writers, even by those who hold this mode of transmission as possible.

Bertin (*l. c.*), who had charge of the hospital Vaugirard, an institution set apart exclusively for syphilitic pregnant women, had already reported that always a certain number of mothers, suffering at the time of labor from severe recent forms of syphilis, gave birth to children who were healthy and continued so.

From the reports of Pick (1873), who followed up the histories of the children of sixty-one syphilitic mothers, it is evident that an inoculation of the mother during pregnancy always has, as a result, either a premature birth, or the birth of a dead child presenting no signs of syphilis, or that a living non-syphilitic child is born. Cases of the last category—ten in number—are quoted, in all of which the mothers were inoculated at all periods of pregnancy, and the children, after being under observation for three months in the foundling asylum, were discharged healthy. In one case, the child was born prematurely in the seventh month (the mother suffered from papules and periostitis), but remained healthy. The fact of the premature birth furnishes proof that, in this case, not

the condition of the child, but the disease of the mother, was the cause of it.

A very instructive case, quite analogous to mine above given (XI.), is reported by Hennig (1861):

A man inoculates his wife in the middle of her first pregnancy, while he himself is being treated for chancres. At the time of labor the syphilide of the wife is still perceptible. The child is born healthy, and remains so in spite of being suckled by a syphilitic mother. In the next pregnancy, notwithstanding a mercurial treatment, she aborts in the fourth month; the next time in the seventh. The fourth child is born at term, but dies when three months old with symptoms of syphilis. The fifth child is also syphilitic, but is cured with the protiodide. Finally, a sixth and a seventh child are born, perfectly healthy.

Here all conditions are fulfilled: the health of both parents at the time of fecundation, and the beginning of maternal syphilis during pregnancy proven, nevertheless the child remains healthy.

Similar isolated cases are reported by Köbner (*l. c.*), Späth and Schaunstein (1859), and Bidencap (*l. c.*).

Baerensprung asserts positively that he has never seen a child with hereditary syphilis born of a woman inoculated with the disease during pregnancy, and gives, in the most circumstantial manner possible, fourteen cases (LXXVII. to XC.) in which the inoculation took place four times in the first half of pregnancy and ten times in the second. The mothers had at confinement, every time, general syphilis, and still gave birth exclusively to healthy children. They were all vigorous at birth, some among them weighing even six and a half to eight pounds. One died when three weeks old from intestinal catarrh, and at the autopsy showed no evidences of a specific affection. The remainder were under observation up to the time of their dismissal, in the seventh, thirteenth, and sixteenth weeks, etc., and continued healthy. Baerensprung adds, that he could have increased the number of these cases considerably, as they are of very frequent occurrence.

Ritter von Rittershain (1870) also relates, that of seventeen

children whose mothers were affected at confinement with recent syphilis (flat condylomata), eight died shortly after birth, and nine were dismissed from the foundling asylum. On none of these were there any traces whatever of syphilis.

In accordance with this, it follows that, in all well-proven cases in which the child is procreated by healthy parents, but the mothers become syphilitic during pregnancy, the disease is not transmitted to the child. All contrary observations and assertions have proved themselves to be unreliable and incorrect. The causes of the inaccuracy are to be sought for chiefly in the following points :

1. The condition of the father is, as a rule, not examined into. Therefore it happens that even those writers who regard this mode of transmission as possible must acknowledge, for the most part, that it fails if the mother is inoculated during the last three months. In these last cases, the individual inoculating the mother and the father of the child are either two different persons, or, if they are identical, it is at least probable that the father only contracted the inoculating lesion after the conception of the child, so that, at the time of fecundation, both parents were still healthy. The nearer the time of the inoculation approaches the date of conception, the more unreliable become all statements, and so much greater the probability that the inoculating man and the father of the child are one and the same person. Consequently, if the mother at the time of conception was not yet syphilitic, still at least the father, who inoculated her, had already furnished diseased semen for the fructification of the healthy ovum. We have, therefore, also conversely the right to regard as established, inheritance from the father, in those few cases in which the inoculation of the mother *after* conception is undoubted, and notwithstanding a child is born with unmistakable hereditary syphilis.

2. The unreliability of the statements in regard to the beginning of maternal syphilis. Here also is an explanation for the fact why, nominally, transmission does not take place in the last months of pregnancy. If the inoculation occurred positively only in the last months, so, at the time of labor, in which usually the mothers come for the first time under obser-

vation, the proof of the period of the inoculation is with a certain degree of probability possible. The further back this period dates, the more opportunity is given for error, and the easier are the condylomata lata (which are the evidence of general syphilis, existing perhaps for months, making their appearance in the beginning of pregnancy, and favored greatly, as is well known, by the progressing pregnancy) confounded with the unobserved primary lesion; and, therefore, the commencement of the disease is transferred erroneously to the period of pregnancy, while already at the time of conception the syphilis of the mother (perhaps even together with that of the father) was developed.

3. The simple fact that in the first months of pregnancy an abortion occurs, that the child dies intra uterum and is still-born, or that it is at all events born prematurely, is regarded as evidence of the inheritance of syphilis, even when there is not the slightest proof of a syphilitic affection of the fœtus. In fact, such an event is by no means infrequent. If the mother is inoculated at the time of, or shortly after, conception, or in the very first months of pregnancy, abortion often results within the next few weeks. In the same manner, a premature birth follows if the mother is inoculated in the later months, and if the eruption of general symptoms takes place before the end of pregnancy, and either a living and non-syphilitic child is brought into the world (as in the above-mentioned case of Pick's), or a macerated fœtus is born, upon which no specific lesions are perceptible, as in the following case:

Caroline M. was delivered, July 8, 1875, in the third lying-in division, of a macerated male fœtus, aged six and a half months, eight days having elapsed since she had felt any motions of the child. Several days previously she had been admitted into the division of Prof. von Sigmund, suffering from papules upon the genitals and a recent macular eruption, which existed in all fourteen days before labor. Upon examination, the fœtus presented nothing characteristic of syphilis; the internal organs, liver, lungs, thymus, etc., were entirely normal, as also all carefully-examined epiphyseal connections of the long bones. Nothing noteworthy about the placenta.

In these and similar cases the outbreak of general syphilis, which, as is well known, is accompanied in most cases with fever, operates apparently in a quite analogous manner to other febrile affections of the mother, which excite so frequently either premature uterine contractions, with abortion and miscarriage, or cause the death of the fœtus, and result in its expulsion only after a longer or shorter time. These occurrences, however, have nothing whatever in common with a transmission of syphilis to the fœtus.

We arrive, after all this, at the conclusion that *a child, both of whose parents at the time of procreation were non-syphilitic, does not become syphilitic even if at any time during pregnancy the mother contracts the disease. This latter may disturb the normal course of pregnancy, and interrupt it prematurely, but is never transmitted to the fœtus.*

The syphilitic virus does not pass from the mother to the fœtus through the partition-wall or septum of the maternal and fœtal vascular systems.

This complete exclusion of the placental infection of the fœtus, arrived at through clinical experience, renders it possible for us to explain several occurrences—more rare, but nevertheless worthy of consideration—which otherwise would remain entirely unintelligible. These are those cases of twin-births, in which, especially in regard to the inheritance of syphilis, important differences in both children are noticeable—either the one appears severely affected, the other in a modified form, or only the one is affected, the other is and remains entirely healthy.

Such cases have been observed by the following authors :

Campbell (1844): A syphilitic woman gave birth to twins, one of which was entirely deformed, while the other, apparently strong and healthy at birth, presented, after several weeks, signs of hereditary syphilis. Price (of Margate) observed that a woman, who had been inoculated by a child at the breast, gave birth after some time to twins, of which one was still-born, the other affected with hereditary syphilis. Clemens (1853): Both parents syphilitic. After the birth previously of a macerated fœtus, twins were born, of which one was apparently healthy, but died after three weeks, while

the other was still-born, and almost putrid. Of late a similar case has been reported by Caspary (1875). Here the mother alone is syphilitic. The birth of a decidedly syphilitic child is followed by one at term, macerated; finally, in the third pregnancy twins are born, of which one—a boy—is strong and healthy at birth, and only after four and a half months is affected with an exanthema; while the girl is born feeble, cries a great deal, has a pale, waxy complexion, a wrinkled face, and after a few days has a general syphilitic eruption.

Puzin (1862) saw at one time twins, one suffering from syphilis while the other remained healthy. Luzinsky (1859) found, with twins, one intensely syphilitic, the other merely anæmic, but without symptoms of syphilis. Hutchinson (1867) saw one twin with exceedingly well-marked syphilis, the other healthy.

If, now, the transmission of syphilis from the mother to the child takes place exclusively, or even if only generally, through the placental circulation, it would be incomprehensible (because we must recollect that this transmission can take place during the whole period, or at least through several months of pregnancy) how two beings, subjected to exactly the same conditions in relation to the effect or action of the component parts of the maternal blood-mass, could the one be severely affected, the other in a subdued degree. It is still less conceivable that the one becomes syphilitic, while the other remains entirely free from the disease. On the contrary, it appears entirely conceivable, and, through many analogies, quite plausible, that, of two cells of procreation (whether maternal or paternal) furnished simultaneously, the one contains the syphilitic virus in a larger, the other in a smaller, amount or intensity, or a third not at all. Also that these parental qualities, like all others, repeat themselves in one child to a greater degree than in the other, and perhaps in a third are entirely wanting.

The same explanation is required by those cases in which, during the period of a noticeably modified power of transmission on the part of the mother, a healthy child is born between two viable children moderately affected with syphilis.

CASE XII. *Chronic Syphilis of the Mother; a Healthy*

Child between Two Living Syphilitic Ones.—A tailor, aged thirty-five, marries, in January, 1864, a cook, aged thirty-two, suffering evidently, at the time of marriage, with chronic syphilis. She is very pale, suffers constantly with nocturnal headache, and acknowledges to have had for several years an eruption on the palms of the hands. The husband is vigorous, and very probably has been always healthy.

1. 1865.—Boy, in the fifth month, still-born.

2. 1866.—Boy, in the sixth month, still-born.

3. 1868.—Female child, at term, lived for half an hour.

4. 1869.—Boy; had an eruption soon after birth, suffered from persistent catarrh, and died, when four years old, from a pulmonary affection.

5. 1871.—A girl; at birth, and later, always healthy. At an examination when three and a half years old showed not the slightest trace of a previously-existing syphilis.

6. 1874.—A girl, born at term; suffers in four weeks from coryza and a maculo-papular exanthema. She is, however, well nourished, weighing, at two months, 4,700 grammes. The specific cachexia is very slightly marked, and a complete cure takes place after a short treatment with the protiodide.

This case also is only explainable by an exclusively ovular transmission of the disease: for we may very readily accept the view that, in a condition in which we must consider the virus as being divided only into the minutest particles in the maternal organism, at one time such an ovum is fructified, which is not imbued whatever with the virus, while at another time, even at the next conception, an ovum very slightly infected is fructified. On the contrary, it is scarcely imaginable that a positively syphilitic woman, during the whole nine months of pregnancy, should not even once transmit the virus to the foetus through the interchange of secretions, if such a transmission is in general possible.

Clinical Records from Private and Hospital Practice.

I.—*Three Cases of Electrolysis in Ovarian Cysts.* By E. CUTTER, M. D., Cambridge, Mass.

CASE I.—Date, October 29, 1876. Locality, Chelsea, Mass. Name, Scott. Age, twenty-four; married. Children, none; abortions, none. Age at which menstruation appeared, twelve years.

Duration of present illness, four years. Symptoms, enormous symmetrical enlargement of abdomen, measuring, over umbilicus and crests of ilia, fifty-eight inches. Chief symptoms, weight and distention. Supposed cause, ovarian disease.

Present Condition.—As regards menstruation, regular, normal in amount, and painless; leucorrhœa, none; pain, none; locomotion impeded by massive size, and dyspnœa on exertion.

Physical Signs.—Touch, distinct waves readily and perceptibly impelled between the points of palpation. No hardness or density. The impression of fluidity was unmistakably conveyed. *Per vaginam*, nothing could be felt but the walls of the vulvo-uterine canal. The uterus was evidently drawn up out of the pelvis. No evidence of pelvic disease. Speculum and probe not used.

Inspection.—She was examined at Dr. Wheeler's office, in Chelsea, by the following physicians: Prof. T. G. Thomas and Dr. J. B. Hunter, of New York; Drs. Semeleder, of Mexico; Bixby, J. G. Blake, G. W. Gay, and Warner, of Boston; Wheeler, Weeks, and Shackford, of Chelsea; Sullivan, of Malden; H. O. Marcy, and the writer, of Cambridge, Mass., and several others, all of whom agreed in the diagnosis of ovarian cyst.

Subsequently Dr. Gilman Kimball, of Lowell, concurred with the others.

There were no systemic signs of suffering. She had not been invalided, and had continuously exercised her calling as laundress.

On November 12, 1876, Dr. Wheeler aspirated and drew off Oj of a turbid fluid having the appearance of urine; taste,

saltish. It coagulated on the addition of heat, and also of nitric acid. Rubbed between the fingers it was ropy and adhesive. Under the microscope it presented fat globules in abundance, the compound granular gorged cell of Gluge, the granular ovarian cell of Drysdale, and epithelium.

The fluid was also exposed to the action of the galvanic current from ten cells of a Fleming & Talbot c. and z. battery. When the needle electrodes were immersed, they were covered with a white coating, which to the eye appeared like coagulated albumen. Under the microscope it was found to be made up of bubbles of gas. There was nothing of the micrographic appearance of the membranous and filamentous coagula obtained by the nitric acid. Further examinations of other electrolytic coagula confirmed this observation. Only in the white of egg were very faint filaments, and that, too, about the negative needle.

FIRST APPLICATION OF ELECTROLYSIS.—Date, November 12, 1876. Place, Dr. Wheeler's office. Battery, that just mentioned. Size of plates, 3 inches \times $\frac{3}{4}$ inch. Number of cells used, thirty. Solution, the ordinary bichromate of potash, saturated solution, fortified with sulphuric acid \mathfrak{z} j to \mathfrak{z} vj. Number of needles used, four. Time, five minutes. Immediate effect, no pain nor eschar. After rising from the chair she complained of pain in the left side, but walked home without any difficulty or inconvenience.

Remarks.—Two needles were introduced on the left side, and two needles on the right. It should be particularly noted that *one* of the needles was the aspirator needle. It was nickel-plated, the smallest of the set, and at the time thought to be suitable; but, being non-insulated, it caused trouble, as the sequel shows.

SECOND AND LAST OPERATION.—Date, November 14, 1876. Present, Drs. W. H. Thorndike and Ham, of Boston; Wheeler, of Chelsea, and the writer. Place, Dr. Wheeler's office.

Present Condition.—Abdomen shining, wrinkled, and lessened in size. The puncture made by the aspirator needle has continuously oozed since the operation. Quarts have been discharged. Judging from the absence of tenderness over the

abdomen, the diminished size, and the mobility of the tumor, it appeared that the fluid had not discharged into the peritoneal cavity. It could not be decided whether the diminution was entirely due to the oozing. The punctures made by the three insulated needles were all completely healed, and, of course, *did not ooze*. This point is worthy of notice and remembrance. The patient was placed in a reclining-chair, and the cyst was pierced with two needles (the smallest insulated needle of Dr. Kidder), one on the left and one on the right side. There was more sensitiveness to the punctures than at the last operation. A connection was made with the full power of the thirty cells of the battery used before, but it was instantly broken, as it was too painful. The current was passed from *one* cell. No pain. It was then increased up to thirteen cells, without any break, by means of the double-headed connection. This seemed to be the limit of tolerance—thirty cells making less disturbance before than thirteen now. Current passed five minutes. In both operations the pulse was not disturbed. After both she walked home with ease.

November 25th.—Dr. Wheeler reports that the aspirator-opening ceased to ooze November 18th. This closure was followed by chills, fever, accelerated pulse, with circumscribed tenderness, swelling, and hardening about the aspirator puncture. She was given opiates to relieve pain, kept in bed three days, and to-day presents herself to the writer at Dr. Wheeler's office, saying that she feels as well as ever she did.

Inspection.—The abdomen looks puckered, like elephantiasis. Around the puncture is a curiously wrinkled appearance, with a depression at the site of each hair.

Palpation.—Much of the pendulous abdomen is fat in the areolar tissue. The cyst could be felt underneath the adipose to the right of the navel. It was globar in shape, and apparently six inches in diameter.

Measurement, forty-two inches, against fifty-eight inches of thirteen days ago.

November 28th.—Over and around the site of the aspirator puncture, for a space of two inches in diameter, there was tenderness pointing to fluctuation, as if pus were beneath.

Bloody serum oozed through a puncture made with a small needle. *The cyst could not be felt.* The fat is perfectly enormous, and obscures the exploration. Woman looking and feeling well, and at work.

December 2d.—The abscess had discharged about Oj of bloody pus. No systemic symptoms of purulent infection. No cyst over fluctuation evident. Patient smiling, and pleased to be relieved of her load. Dr. Wheeler measured over the iliac crests, and found the distance forty-one and a half inches. At the November 12th measurement the navel was in this line; to-day it was several inches below. The protuberant fat could be grasped with both hands without pain. Told to avoid starches and sugars, in order to diminish fatty tissue.

6th.—Abscess closed. Bowels smaller. Absolutely no sign of the ovarian cyst.

13th.—Health good. While standing up, no cyst could be detected; but when she laid on her back, with knees drawn up, a hardish rounded mass could be felt on the right of the umbilicus, about 3 inches in diameter. *Per vaginam*, uterus not felt.

21st.—Hardened cyst more readily felt. Adipose much less.

29th.—"Continues to improve," Dr. Wheeler writes.

January 19, 1877.—He reports an increase in the size of the tumor.

February 8th.—Tumor hard, inelastic, and apparently six inches in diameter. Gives no trouble.

20th.—She has gone into house-service as cook. No fluctuation in tumor; size the same. Gives no pain. She moves about lightly, and enjoys good health. She remained so at last accounts.

Remarks.—The points of interest in this case are:

1. *It received only two applications.*
2. The large number of needles (four) and the large number of cells employed. Semeleder uses only *one* needle (negative).
3. The lesson taught by the aspirator needle. The result showed that the action on the tissues immediately in contact interfered with its vital tonicity. They were unable to con-

tract, as they do in aspiration alone. The needle was the smallest of the set. The three insulated needles acted as in common aspiration, and caused no trouble. We are forced to conclude, that if the aspirator needle had been covered there would have been no inflammation nor abscess. Judging from this case alone, we would decidedly say, Use no uninsulated needles.

4. Some may say that the result was due to the oozing only. If so, it is strange that the disappearance of the oozing was followed by local inflammation and continuous disappearance. We have no such disappearance after tapping, usually. Still, it is not desirable to force conclusions. We are only giving history, and the readers may draw their own conclusions.

5. We would call attention to the fact of the robust general health of the patient conferring a tolerance of the galvanism. In a person of feeble make or nervous temperament it would be unadvisable at first to use so strong a current.

6. This history is not complete. It has a future, to which we look with interest.

7. The writer would here express his thanks to Dr. Semleder for the advice and assistance he rendered in this case. Although his ideas were not strictly carried out in using so many needles and so strong a current, still the operation would not have been performed as it was but for his influence. The experience the writer has been permitted to acquire in the treatment of uterine fibroids by galvanism, influenced the procedure. The process in the latter cases is so severe, profound, and grave, when compared with the mild, superficial, and light though successful procedures in ovarian cysts, that no hesitation was felt in giving the enormous tumor what might be called an enormous *dose* of galvanism. The writer wishes, however, to be distinctly understood as advising the milder measures, and even the *per cutan* method, even if it involves much more time and trouble.

CASE II.—Date, October 29, 1876. Place, Chelsea, Mass. Name, Mrs. Read. Age, forty years. Number of children, three; no abortions. Time since last pregnancy, about three years. Temperament, nervous to an extreme. Duration of present illness, twelve months.

Present Condition.—As regards menstruation, irregular, scanty, very severe pains, and cramps in the bowels and lower limbs. Pain pretty constant in abdomen.

Physical Signs.—Inspection (made by the same physicians as in Case I.) showed a conical protuberance of the lower abdomen ; wavy when lightly struck.

Palpation.—Showed it to be globar, soft, elastic, fluctuating, wavy, distinctly defined.

Diagnosis.—Ovarian cyst, unquestionably.

Treatment.—Dr. F. Semeleder, of Mexico, in the presence of the gentlemen alluded to, introduced one gold-plated steel needle into the cyst through the walls of the abdomen. This was connected with the carbons of the battery used in Case I. A sponge electrode was connected with the zincs and applied to the opposite side of the tumor. Current continued for three minutes ; *ten* cells were used. The operation was performed at Dr. Wheeler's office. The patient then returned to her home, three miles distant.

November 12th.—Presented herself at Dr. Wheeler's office. She had performed her own housework. Immediately after the operation she was taken with her menstrual flow. It was painless and crampless—the first immunity of this kind she had had for years. She was considerably prostrated and weakened. The cyst had reduced at least one-third in size.

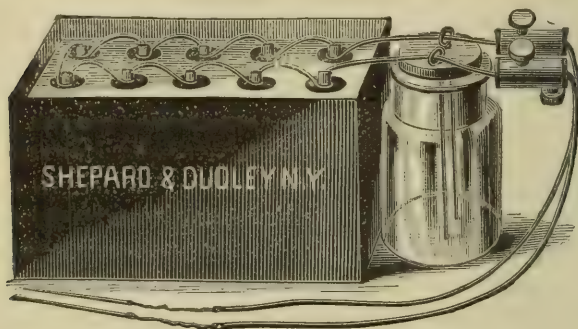
With a Kidder *insulated* needle the operation of October 29th was repeated. No pain or other trouble experienced.

25th.—Tumor less than one-half its original size. Still complains of general prostration and great nervous disturbance. Applied two needles of the Cutter battery (*see cut*). Devised to have a portable, simple, and cheap apparatus, that can be used roughly without fear of breakage. Its length is four inches, breadth one and five-eighths, inch, height two and a half inches. Elements, copper and zinc. Exciting fluid, vinegar. It rapidly decomposed salt water. Number of cells, *ten*. Shepard & Dudley, of New York, have the battery.

28th.—Complains of nervous prostration ; still she does the housework of a family of three, and sews on carpets. Applied Cutter battery, *ten* cells, two needles, five minutes.

December 6th.—Tumor about the same size. General

health improved. States that the after-effects of the previous operations were always pain, tenderness, and distress in the



abdomen, lasting, however, only a short time. Although she was menstruating, on account of the remoteness of her residence, I applied the battery as on November 28th.

12th.—Was informed that she suffered very much for days subsequently from pain, after last operation. Was kept awake all night with pain.

13th.—Mrs. Read says her menses were stopped by the operation of the 6th. Her bladder and bowels had violent spasms, causing intensest suffering. Still she enjoyed good health now, and was courageous, but very nervous. The tumor was evidently smaller, and its wall thickened and dense.

Dr. Wheeler held the movable cyst steady while the writer introduced two needles into it. They met with unusual resistance. Current was continued three minutes; patient did not suffer. Morphia was ordered as a prophylactic.

21st.—Tumor unchanged. Last application made little impression. Repeated the application.

January 19, 1877.—Cyst smaller and denser. Cramps occurred at last menses. General health improved. Applied battery as before; this was the last application.

March 28th.—Mrs. Read presented a large abdomen. It was tympanitic throughout, except at lower part. On palpation there was a peculiar parchment-crackling feel, quite unlike anything before met with by me. There was nothing like a wave to be felt or seen. There was no movable globar

tumor. She states that her bowels were moved but once a week, and then hardened scybalæ were voided, with such sharp corners as to cause hæmorrhage by cutting the mucous membrane of the rectum. She was ordered sulphate of magnesia 3j once in four hours.

April 5th.—Relieved.

12th.—Reported very comfortable.

May 12th.—Fluid returned to some extent. Electricity continued.

Remarks.—The effect of galvanism in relieving pain was well marked in this case. The result of an application by the two-needle method during menstruation does not justify its repetition. It stopped the flow, and caused more after-trouble than any other application—even causing worse spasms than were experienced before. This was directly opposite to the effect of the intermenstrual applications. In none of the seven applications of the *insulated* needles was any trouble caused by local action. Indeed, no trouble was caused by Dr. Semeleder's gold-plated needle in the first application. The trouble in Case I. was caused by a *nickel*-plated needle. I think, though, that Dr. Semeleder would not use even the *gold*-plated needle now. If my experience is worth anything, it teaches decidedly *never to use any but an insulated needle*.

CASE III.—*Case of Ovarian Cyst treated with Electrolysis.* February 17, 1877. Medford, Mass. Miss B., aged thirty-four years, noticed for the first time, in April, 1876, an enlargement in her abdomen. She is a single woman, subject to dyspepsia, vaginismus, burning pain, and distressing sensations in the abdomen. A year ago she had an illness of a serious nature occasioned by some obscure hepatic disease. Subsequent to this sickness the enlargement was developed. Although her general health has somewhat improved of late, the tumor has rapidly increased, making her look quite large. Temperament nervous.

Present Condition.—Rather spare, pale, and weak. Cannot stand up straight. Subjective signs indicate a disturbance of the nervous system. Dysmenorrhœa, with scanty flow; no hæmorrhage, menstrual or intermenstrual. No leucorrhœa.

Inspection.—Abdomen full, and larger on the left than right. A peculiar longitudinal furrowing of the abdomen over the recti muscles on attempting to rise from the lounge. The enlargement extends to the ensiform cartilage of the sternum. A distinct wave seen on

Palpation.—Elastic feel of a large globar mass; fluctuation distinct; waves small, and rapidly propagated.

Per vaginam.—Uterus anteverted and anteflexed; not enlarged. Abdominal tumor not felt in pelvis. Pressure on uterus not communicated to it.

Percussion.—Tumor dull and flat. Clear resonance on the extreme right of abdomen.

Aspiration produced a greenish liquid, sticky, adhesive, saltish to taste, and presenting under the microscope the compound granule of Gluge, the granular ovarian cell of Drysdale, epithelium, and fat globules. The aspirator needle moved freely about in a large cavity filled with the fluid.

Diagnosis.—Ovarian cyst.

Treatment.—*February 15th.*—Applied a small insulated needle to inside of cyst a little to the left of the umbilicus. Connected it with the negative element of the small Cutter battery. The positive element was connected with a small zinc button and applied to the right side of the tumor. The current from ten cells was applied for *three* minutes. The battery was excited with strong cider-vinegar, and decomposed salt-water readily before application. She complained somewhat of the needle. Present, Dr. John C. Dorr, of Medford.

18th.—Suffered some pain, after the operation, in breathing. Measurement, thirty inches around most prominent part of the abdomen. Introduced the same needle a short distance from the first puncture, and applied the battery as before, four minutes.

It was impressed on the operator to use great care in this case.

21st.—Feeling well; appetite good. Bowels wrinkled. Measurement, twenty-nine inches. Can stand up straighter. Percussion tympanitic over upper part of tumor. It is evidently reduced in size. Applied battery for seven minutes, as before; one needle introduced. Not much pain experienced.

The battery was left with her, with instructions to use it every day for two hours' time by the *per cutan* method—that is, the simple application of quadrangular copper electrodes to the opposite sides of the tumor, without puncture. This procedure was kept up throughout the case.

24th.—Found her feeling quite sore. It hurt her to cough, over a circular area of one and a half inch radius, with the site of the puncture as a centre. No objective signs of inflammation about the site of puncture. Bowels swelled to thirty inches. Upper part of tumor dull. It was decided to desist from any needle applications, and rely upon the *per cutan* method alone. This was done, with the same battery, until March 10th, when it was replaced by a Hall's French c. and z. battery, with an induced current, which decomposed water sufficiently. She had applied it *per cutan* for one hour daily. Thought she missed the effect of the battery whenever it was disused. Measurement, twenty-nine and a half inches. Tension less. Employed decoction of herbs for soreness in abdomen. Troubled with gastric faintness.

March 21st.—Measurement, thirty and half inches. Abdomen distended and tympanitic. Stomach troubles her very much. More to please the patient than anything else, as the gastric distress was so much relieved by the first aspiration for diagnosis, a small area of dullness was found, and the aspirator needle introduced into the cyst. Less than one pint of greenish fluid could be withdrawn. It was a little flocculent, and contained Gluge's and Drysdale's cells.

From the limited amount of fluid withdrawn, from the small area of dullness, from the general tympanitic percussion, it was inferred that the distention was due to the difficult digestion, and that the cyst was really very much diminished. Ordered her Linck's Stuttgart ext. of malt, Wyeth's elixir pepsine, bismuth and strychnia, and Morson's chlorodyne.

Replaced the Hall battery with another of my batteries. Carbon and zinc, ten pairs, 6 inches \times 1 inch. Acid, bichromate of potash solution, which decomposed water very freely. Current applied, one; three hours daily.

27th.—Feels much better; was not obliged to use the chlorodyne. Appetite was very much improved—owing to

the aspiration, she thinks. Likes the malt. Measurement, twenty-eight inches. Much tympanitic percussion; small area of dullness. Slight wave-impulse. Has resumed the Hall battery, as mine did not work. (This was afterward found to be due to the fact that a new solution is needed each time it is used, as it takes $\frac{3}{4}$ viij of solution, and there are two hundred and forty square inches to be acted upon.)

April 2d.—Measurement, twenty-eight inches. Form now erect. Been out into the air daily. Feels very much better. Appetite much improved. Is now able to eat meat in quantity, which she could not do before. Attributes this change to the diastase. Abdomen tympanitic throughout; no wave; no globar tumor detected.

6th.—Measurement, twenty-seven inches. Appetite very good. Can eat potatoes in hash, besides the meat—a new thing for her. Likes the malt, and takes about one teaspoonful thrice daily. The malt gets the credit of the improvement. No sign of tumor except size. Percussion of abdomen tympanitic throughout; no fluctuation; no wave.

13th.—Nearly down to usual size. No wave; no dullness; no globar mass. Took cold by exposure; coughs somewhat; no physical signs of lesion in the lungs. The battery caused a painful contraction of abdominal muscles, and was discontinued. Appetite good, for animal food. Digestion improved. Till she took cold she was feeling very well indeed. Vaginismus disappeared during the treatment.

It is now proposed to cease the interference, and watch further developments.

Remarks.—1. The needle-method was abandoned for the *per cutan* method, because the patient grew more and more sensitive at each application; because it was desired to test the *per cutan* method; and because of the alarm of the surrounding observers. It is firmly believed the results would have been attained without the needle—that is, if time is regarded as of no importance.

2. The change of batteries. The patient had some difficulty in using the little zinc and copper battery of mine, probably due to defective insulation; possibly due to the patient, as others of my patients have used and are using similar

batteries without any trouble whatever. The point to be insisted on in the battery for these cases is, *to have it decompose water*. This was done by the *mildest* current of the Hall battery, though not so perfectly as with my own. The larger the cell, the less the pain. Every battery, before use in an ovarian cyst, should be tested upon some fluid solution of a salt. If gas-bubbles freely rise from the electrodes, the battery works properly. It is not a question of battery simply; it is, *Will the apparatus used decompose water?* The faradaic or the induced current is not wanted, as it is understood.

Even the Hall battery, in this case, acted on the abdominal muscles so much that it was discontinued. Indeed, as the case stands, no battery is needed at all, as there are no physical signs of the cyst.

This paper must not close with simply the history of these cases, as the casual reader may draw erroneous conclusions from the results of my experience in them. There is danger in this operation. Dr. Semeleder has already reported a case, in which I assisted him at the first application. This patient received several other applications, but died apparently from peritonitis developed around the puncture of the needle. Dr. Thomas reports two other fatal cases occurring in Dr. Semeleder's practice in New York, making three deaths. At the autopsies the punctures were found unhealed. In the light of the history of these cases, one should use great care how he punctures the cysts. In my opinion the deaths were caused mainly by the use of an uninsulated needle.

Fieber, the originator of the operation, now advises against it. I have given my own cases honestly as a historian and witness, not as an adviser of performance of the operation in future.

Correspondence.

NEW YORK, June 15, 1877.

EDITOR OF THE NEW YORK MEDICAL JOURNAL :

Sir : In the June number of your JOURNAL I noticed, under the head of "Progress of Medicine," that "Dr. Giacomo finds

strong injections of nitrate of silver very useful in certain cases of chronic cystitis," and that he used "eighty centigrammes of the nitrate to thirty grammes of water, and cured the disease with great rapidity."

It is nearly three years since I first used strong solutions of nitrate of silver in chronic cystitis. In ten cases, ordinary injections failed. I employed a solution containing sixty centigrammes of the nitrate to thirty grammes of water, gradually increasing the quantity of the salt to *two grammes*. In four instances a well-marked amelioration in the symptoms followed; but, as soon as the injections were discontinued, a relapse invariably occurred. In one case hæmaturia was produced, which continued five days. In no case was a cure effected.

JOSEPH W. HOWE, M. D.

Clinical Reports of the Demilt Dispensary.

CLASS FOR DISEASES OF THE THROAT.

SIX CASES OF ACUTE ŒDEMA OF THE GLOTTIS, BY GEORGE M. LEFFERTS, M. D.

THE following cases of acute œdema of the glottis, due in the majority of instances to exposure and subsequent acute inflammation of the larynx, terminating, as it rarely does, in œdematous infiltration, have occurred during the past three years in my service at the Demilt Dispensary. I have collected them from my note-book and grouped them together, excluding, in so doing, many cases of chronic œdema occurring in either syphilitic or tubercular disease of the larynx, which, though demanding scarification in some instances, cannot properly be classed among those of which I am about to write, and present them because I believe such cases to have a practical interest—an interest which must be equally shared by the general practitioner with the specialist—and because they illustrate well the different phases of this formidable affection, especially in its earlier stages, when diagnosis is im-

portant, if time would be saved, and life, perhaps, preserved : a stage on which the accounts or descriptions of the disease that I find in the literature of the subject do not dwell, devoting themselves mainly to those of a later date, when urgent dyspnœa and imminent danger of suffocation confront the patient and demand a prompt and ready diagnosis, a skillful and efficient treatment at the hands of the surgeon. The importance, then, of recognizing the nature of the disease, its extent, and its location, in its incipient stages, will be universally conceded ; and my cases will perhaps be of interest, and of some value, in showing that this may be done, and that prompt treatment will, in the majority of instances, save the patient from further and greater dangers.

I will furthermore run the risk, before I proceed to narrate them in detail, of being accused of riding a hobby, when I call attention to the important part which the laryngoscope has played both in the diagnosis and treatment of all the cases ; and claim that its early use in most of them, when a diagnosis by any other means would have been impossible, permitted of an early recognition of the actual condition of the parts, and consequently of an intelligent and effective treatment. I am all the more ready to insist upon the great advantages to be derived from its use in all like cases (and it is with the class alone that I am now dealing), in spite of the fact that it may seem to be arguing a point which is universally conceded, because I do not have to seek far to find, both in books and in practice, advice that I hold to be unsafe, consequently improper, and a treatment that is certainly unscientific, and often unreliable, in its means employed. I allude to digital exploration as a means of diagnosis, and to incisions made blindly, and without accurate knowledge as to proper locality, as a means of treatment. I would ask the reader whether he has ever explored the upper parts of the larynx (I will throw out, for the moment, the lower parts of its cavity, though some claim that their condition will also be shown by touch) with his finger, and has been perfectly satisfied with the results which it has furnished him ; whether he would be willing in all cases to rest his diagnosis upon the knowledge so obtained, and to

base his treatment upon it, especially when he remembers that an instrument is at hand which will *show* him what he seeks to know—show it in all its details—show it in cases where dyspnœa is so great that he would fear to add to it, or provoke laryngeal spasm, by thrusting his finger down the sufferer's throat; and which will, moreover, differentiate for him the nature of the disease with which he has to deal from many others with which it is liable to be confounded, and from which his finger alone cannot, and will not, show him the way, nor suggest appropriate treatment?

I confess freely that I am not, and that my finger, although I have sought all proper opportunities to train it, is not as reliable a guide as my eye; and I believe that many surgeons will agree with me. Again, in treatment, why should we be told—still less do it—to pass a hernia-knife or guarded bistoury over the base of the tongue and scarify the œdematous parts? The direction sounds easy. It is easy to cut; but is it a scientific method, and true surgery, to do it in this way? Most surgeons like to see *what* they are cutting, and *where*. Few would close their eyes, when they might keep them open while the knife was in hand. The use of the laryngoscope will solve the problem—will show not only when, where, and how, to scarify, but allow of the surgeon's seeing while he is doing it. Can there, then, be any question of choice between the above methods, both of diagnosis and treatment? It would seem not. But I have reason to believe that my ideas are not always shared—that old ones still prevail—and can but express the wish that the laryngoscope may come to play the important part in the diagnosis and treatment of *œdema glottidis* that it merits, and has been proved capable of; that it may become universally employed and commonly resorted to in time of need by all practitioners, its usefulness recognized, its good results appreciated.

CASE I.—J. L., a laborer, aged thirty, informs me that, three days ago, after exposure to bad weather, his throat began to give him pain upon swallowing, but, thinking that it was an ordinary affair, he paid no special attention to it, continued at his work, and allowed it to remain untreated. During the night of the third day, the dysphagia in the mean while hav-

ing become progressively worse, he was suddenly awakened from sleep by a sense of obstruction to respiration, a feeling of fullness and choking in the throat, and great pain ; and the remainder of the night was spent by him sitting upright in bed, in obtaining a sufficient supply of air for respiration, and in clearing the throat of the constantly-accumulating mucus and saliva, which only added to his difficulties. The next morning he came into my hands for treatment. The laryngoscope showed at once the cause of his dyspnœa, the entire left half of the laryngeal aperture being markedly œdematous ; the left arytenoid, with its corresponding ary-epiglottic fold, was swollen out into a large, oval, soft mass, which pressed into and closed up entirely the posterior commissure of the larynx, overhung and diminished more than one-half its superior opening, and, together with the misshapen and tumefied epiglottis, one-half of which was alone implicated, and afforded a very pretty illustration of the gradual march of the œdema—formed an œdematous semicircle, which to all appearances was rapidly progressing in extent. All parts of the larynx and pharynx, excepting those distinctly œdematous, were deeply congested, presenting, in short, the characteristic appearances of an acute inflammation. Scarification was immediately performed, the instrument used being in this case, as in the others which follow, the guarded laryngeal lancet of Türck—a double-edged, sharp-pointed knife, which remains concealed by a suitably-curved sheath during introduction through the mouth, and is only pushed forward and exposed by means of a slide upon the handle of the instrument under the operator's right forefinger, when the parts which it is desired to incise are reached. This done, the knife is again drawn back into its cover, and the instrument withdrawn from the mouth. The whole procedure, as here shortly described, takes place under the eye of the operator, the laryngeal mirror introduced into the fauces, being held by the left hand, presenting a perfect picture of the parts and of the action. And here let me say, that an assertion which I have heard made, viz., that a patient suffering from an urgent dyspnœa will not, cannot, allow of a laryngoscopic examination being made, sufferings and struggles for breath are too great, is not borne

out by my experience. I have made, and expect to make, many more laryngeal examinations of patients while suffering from extreme difficulty of respiration due to various causes, and have yet to see one in whom an examination, if made with care, some dispatch, and a little skill, was not amply sufficient and satisfactory for all diagnostic purposes. As regards operative steps, it is a noteworthy fact that such patients are much more tolerant, and will aid the physician's efforts with greater fortitude, than those who suffer in many instances with the slightest and least dangerous of throat-affections.

To return to the case. Four deep incisions were made into the œdematous tissues: two over the mass formed by the swollen arytenoid, and one over the epiglottis and ary-epiglottic fold respectively. And here again let me digress for one moment, to say to those who have never as yet treated cases such as the above by scarification, that the incisions are not usually made with as great ease as like incisions into like infiltrated tissues elsewhere are. The point of the knife does not pierce at once; the parts are apt to give way before it, unless unusually tense, and *considerable pressure* with a *very sharp* knife is necessary to effect the little operation with success. Again: the sacs or bladder-like swellings do not always collapse at once, as in one case that I report, as soon as they are relieved of their contents. They may do so slowly; they may not do it at all; the latter cases being those in which the contained serum is of a gelatinous consistency, and are, indeed, serious ones, which will probably demand a speedy tracheotomy. Upon this point Sestier's observations may be quoted as illustrative, exceedingly important, and interesting: "In twenty-three *post-mortem* examinations after incision was made into the œdematous tissue, the fluid flowed, with little or no pressure, in ten. In six but little was evacuated on repeated pressure; and, finally, in seven there was no flow whatever, the material infiltrated being of gelatinous consistency, or appearing as if coagulated."

In our case, after incision, the serum flowed readily, and a few moments later the patient stated that the sensation of fulness and obstruction in his throat had in part disappeared,

and that he could swallow easier; the improvement in respiration was almost immediate and very marked. Ordered steam inhalations, with tinct. benzoin comp. every hour. The following morning the patient was again seen. Inspection of the parts showed that the œdema had entirely subsided; general inflammatory redness, causing some dysphagia, still existed, but in turn disappeared within the following two days under appropriate astringent applications. Patient then discharged cured.

CASE II.—On January 2, 1875, a strong, well-developed man entered my room at the dispensary gasping for breath; each inspiration was loud and stridulous, accompanied by a throwing backward of the head, and violent contractions of the muscles of the neck and chest; his face was deeply congested, and covered by a cold sweat; the lips blue, and his whole appearance denoting the greatest anxiety and apprehension. My questions as to the cause of his dyspnœa were answered with difficulty, in a hoarse whisper, each attempt at speaking being followed by forced and hurried efforts at respiration, but developed the following facts: The day before being New Year's, he, feeling it incumbent upon him to celebrate it in a fitting manner, had indulged very freely in alcoholics, and had then been exposed for hours to cold and wet; retiring at nine o'clock, he was awakened some time after midnight by difficulty in breathing; at first this was slight, but rapidly grew worse; attacks of paroxysmal dyspnœa, due probably to laryngeal spasm, developed toward morning, until the condition finally became as I have described above, and had lasted, when I saw him, some two or three hours.

Laryngoscopic examination showed that the epiglottis was swollen, especially upon its laryngeal face, erect and rigid, was folded upon itself, and had a horse-shoe form. Both arytenoids, the inter-arytenoid fold with the ary-epiglottic ligaments, were most markedly œdematous, especially posteriorly, all together forming a thick, soft, reddish-gray, and translucent oval, which encircled the superior laryngeal opening. The various parts of the larynx were only distinguished with difficulty, all being blended into one œdematous mass. The false vocal cords could not be seen as distinct from the ary-epiglott-

tic folds which lie above them, and the epiglottis itself seemed to be continuous with the same folds on either side. A glimpse of the vocal cords could only occasionally be caught, as the irritability of the patient's fauces was great, and the mirror was only tolerated in the fauces for a moment at a time. A clear view was also prevented by a quantity of mucus which filled up the cavity of the larynx, and which was thrown into bubbles by the expiratory current. The above-described conditions, then, had caused a very nearly complete closure of the laryngeal cavity. Scarification was at once practised, the incisions made being deep and extensive. Free bleeding followed, and the patient in a short time expressed himself as being considerably relieved—an opinion which was confirmed by the observation of several medical gentlemen present. He was watched for some three-quarters of an hour longer, when, there being no question as to the marked improvement which had taken place both in his respiration and general appearance, he was sent to his home and ordered to use steam inhalations during the day.

The same afternoon, some eight hours later, he was again seen by Dr. Lockrow and myself. We found that the amelioration of symptoms above described had only been temporary, lasting for some three hours after the scarification. Urgent dyspnœa was again fully established, and its symptoms were even worse than at the morning visit. The laryngoscope showed that the œdematous infiltration had increased, that the parts had assumed a more sacculated form, and that the larynx was more completely and effectually blocked up than before. Scarification was again resorted to, made even more extensively than on the first occasion, and the result was equally satisfactory. The necessity of tracheotomy in case of a recurrence of the bad symptoms was explained to the patient, but was strongly opposed both by himself and wife.

At nine o'clock the same evening the patient was again visited, and his condition found to be satisfactory; the respiration, though still forced and stridulous, was much easier than during the afternoon. A clearer view of the condition of the larynx could be obtained; for the œdema, though to a lesser degree, still present, of the superior parts, had subsided, and

it was seen that below, in the neighborhood of the vocal cords and over the cushion of the epiglottis, it was still marked. It was thought advisable and safer to attempt to still better his condition by scarifying these parts, unseen and unreachable before. This was done. At three o'clock on the following morning I was hastily summoned, and, upon reaching my patient, found that serous infiltration had again recurred, and that his condition was far more dangerous than at any previous time. There is no need for me to recapitulate all of the symptoms; suffice it to say, that tracheotomy, beyond question, afforded him his only chance for life.

Preparations were hastily made; and, assisted by Dr. Asch, who kindly came to my help, I performed the operation in the usual manner, without the aid of an anæsthetic. It was not an easy one to do. The anterior portions of the neck, over the thyroid cartilage and in its neighborhood, were occupied by dense cicatricial tissue, and the deeper tissues were generally indurated, together rendering an identification of the parts nearly impossible: the condition being the result of an attempt made to cut his throat—which certainly succeeded—by guerillas during the war. A small tenement-house room and a dim kerosene lamp still further embarrassed the operation; which, however, when completed, and the tube introduced, afforded the most marked relief to the suffering patient.

The subsequent history of the case, and its unfortunate and to me unexplainable termination, may be summed up in a few words:

The operation being done on January 3d, on the 5th a general bronchitis developed, which, however, subsided within the next few days. On the 6th he could breathe freely through the larynx when the tube was closed. On the 7th the tube was closed by a cork, so that respiration was carried on by the natural passages. On the 14th, as a laryngoscopic examination demonstrated that all signs of œdema had disappeared, and that the larynx had resumed its normal appearance, with the exception of a slight and generally-diffused redness, the tube was removed and the wound brought together. On the 17th the wound healed. On the 22d, six days later, the patient died suddenly and quietly, while sit-

ting in his chair; I do not know why, or of what. His general condition, from the time that I ceased my attendance on January 17th up to the time of his death, had been steadily improving. He ate and slept well, his respiration was uninterrupted and easy, and in all respects I thought that he was upon the high road to recovery. His sudden death is therefore unexplainable to me; and as a *post-mortem* examination was denied, I must of necessity leave the case in this unfinished, and to me, with many others, probably, unsatisfactory condition.

CASE III. occurred in the person of a laborer, aged thirty. I find it recorded in my note-book as follows: Six days since, he complained of sore-throat and swelling over the right side of the neck, both of which he attributed to exposure. Dysphagia progressively increased until two days ago, when respiration became slightly labored—not marked enough, however, to give him much discomfort until last night, when, one hour after retiring, he was suddenly seized with a marked increase of the dyspnœa. Inspiratory efforts became violent and stridulous, requiring the patient to sit upright. Expiration comparatively unobstructed. Deglutition very painful, and the flow of saliva profuse. This condition remained the same throughout the night, abating toward morning.

The laryngoscope shows the right arytenoid and ary-epiglottic fold to be œdematous; especially the latter, which is rounded out and thrown into thick folds by the serous exudation within it, and projects nearly halfway across the laryngeal opening, covering entirely from view the parts which lie below. The epiglottis and remaining portions of the larynx are much inflamed and swollen, but exhibit no signs of œdema.

Scarification was performed, and the œdematous parts thoroughly incised. The œdematous tumor could be seen to collapse under the strokes of the knife, and, the operation being completed, the sac lay loosely, devoid of its serous contents. The patient immediately stated that the feeling as if some foreign body were lodged in his throat, which he experienced when he attempted to swallow, had disappeared, and that his breathing was much easier.

The following day an examination of the larynx showed

that the parts scarified had resumed their natural size and appearance, with the exception of an inflammatory blush diffused over the right half of the larynx. The incisions made the day before could be plainly seen. Ordered to use steam inhalations for a day or two, and to avoid exposure. Discharged cured.

CASE IV.—A girl, aged twenty, while walking upon the ice, winter before last, and carrying a heavy hat-block in her arms, slipped and fell in such a manner that the block was caught between the right side of her neck and the curb-stone. The first effects of the violent blow soon passed away, but an hour or two later her throat, as she expressed it, “swelled inside;” deglutition became painful and obstructed, and during the night there was considerable interference with free respiration. I saw her the next morning; the neck over the right side of the larynx was contused and ecchymotic. The right ary-epiglottic fold, as seen in the laryngoscope, was filled and enormously distended by effused blood, giving it a dark bluish-red appearance, very distinctive from the pale-red or grayish-yellow translucent color of the œdematous parts in the immediate neighborhood, viz., the arytenoid and part of the epiglottis. The conditions together caused considerable diminution in the calibre of the laryngeal opening, and gave rise to the above symptoms. I had evidently to deal with a case of laryngeal hæmorrhage into the submucous connective tissue, of traumatic origin and rare occurrence,¹ complicated by a secondary œdema of the parts.

The effects of the accident having to all appearances reached their height, and the amount of dyspnœa not being excessive, I thought best to leave the matter to Nature, and not attempt incisions into the blood-tumor.

All symptoms rapidly disappeared, and some days later the laryngoscope showed no signs of the condition above described.

CASE V.—Maria O. came to me for treatment for great pain and difficulty in swallowing—“as if something stopped the swallow”—and a noticeable change in the freedom of her respiration. She had taken cold in her throat, she stated, two

¹ See Bogros in Sestier, “*Traité de l'Angine laryngée œdemateuse*,” Paris, 1852. Pfeufer, *Zeitschrift für rat. Medicine*, Neue Folge, Bd. iii.

days since. Inspection showed that both arytenoids were swollen into great round, tense rolls, of a translucent appearance, fully distended with serum, in such a manner and to such a degree that they were tightly crowded one against the other, and projected forward into the cavity of the larynx so as to reduce its free space very considerably. The remaining portions of the larynx and the pharynx were deeply congested.

Free scarification, which did not need to be repeated, effected a speedy cure.

CASE VI.—On March 29th of this year I was asked by Dr. W. E. Bullard to see the following interesting case, occurring in his service. The boy, aged five years, had complained of feeling cold and sick on the day previous—a damp and rainy one—during which he had been exposed for hours while at play in the street. During the night his mother was awakened by the noise that the child made in breathing, and the latter became so rapidly worse and so excessive, that, as she states, she was afraid that he would “strangle before morning.” The doctor saw the case at noon on the 29th, and tells me that at that time the patient presented all the symptoms of an urgent dyspnœa. There was marked depression of the abdomen and supra-clavicular spaces during the violent inspiratory efforts, which possessed a peculiar laryngeal or croupy stridor; the face was cyanotic, the surface bathed in profuse cold perspiration, and hoarse laryngeal whisper and cough completed a list of symptoms which certainly seemed to justify the diagnosis of “croup.” The laryngoscope revealed instead the following very rare condition as the cause, and differentiated the disease from one of which it presented every appearance:

The pharynx and interior of the laryngeal cavity—the latter not only readily examined by me, but demonstrated to Dr. Bullard, the little patient being unusually obedient and tolerant—showed all the evidences of an acute inflammation of the membranes. The vocal cords were seen somewhat congested, their free margins alone being grayish-white, and widely abducted, but nowhere above them any evidences of stenosis, or of membranous deposit; below them, however—that is, in the subglottic space—sufficient cause existed to

that is, in the subglottic space—sufficient cause existed to account for all the symptoms. The parts were swollen out into reddish, rounded tumors, which occupied both sides and the posterior portions of the subglottic region, forming, as it were, a thick ring with a narrow fissure in the middle, which encircled the larynx and encroached very considerably upon its free space, thus explaining the peculiar stridor on inspiration. Its surface was covered by small patches of membranous deposit and thick, adherent mucus. The condition resembled very closely that which I have described as occurring in the supraglottic form of œdema, incorrectly termed œdema of the *glottis*; the distinguishing characteristics of the former being its color, its appearance of inflammatory tumefaction rather than great œdematous infiltration, and especially its depth and location below the vocal cords; the latter being distinctly seen, both in adduction and abduction, *above* the tumors. There could be no question, in short, that we were dealing with one of the very rare cases of subglottic œdema, first mentioned by Sestier, termed *œdème sous-glottique* by Cruveilhier, and more recently described by Gibb and Von Ziemssen; and our case, in connection with the general subject, has a special interest in view of the fact that the occurrence of such a condition is denied by good authorities. Hasse,¹ for instance, observes “that the swelling (of œdema of the glottis), being dependent upon infiltration of the submucous cellular structures, cannot extend to the inferior surface of the glottis, because there no layer of cellular tissue exists.” Erichsen² says “that it is a pathological fact of much importance, that the effusion never extends below the true vocal cords, being limited at this point by the direct adhesion of the mucous membrane to the subjacent fibrous tissue, without the intervention of any cellular membrane;” and, did space permit, Hewitt’s³ testimony to the same effect, and his interesting experiment to prove it, might be added.

Gibb,⁴ in controverting these statements, remarks, “that in

¹ “Pathological Anatomy,” p. 272.

² “Science and Art of Surgery,” p. 723.

³ *London Journal of Medicine*, vol. i., 1849, p. 129.

⁴ “Diseases of the Throat,” 1864.

his dissections he has found a thin yet distinct layer of areolar tissue between the cricoid cartilage and the mucous membrane, and that sometimes it is quite lax. Under such circumstances, if inflammation were present, a submucous effusion would be liable to occur; but, as the resistance is greater below than above the glottis, serum would be exuded from the surface of the membrane, and fibrin remain behind." We may also add, that of late ample clinical experience has demonstrated practically that such a condition does exist; the present is one case out of many which proves it. Gibb's latter statement is important, as it will account for the presence of the membranous deposit (croupous, I suppose it may be called) upon the surface of the swelling, in mine and in other cases.

At the time at which I saw Dr. Bullard's case, late in the afternoon, the urgency of the symptoms had somewhat abated, and, although the respiration was still stridulous and difficult, the signs of non-aëration of blood had passed away, and no immediate danger was to be apprehended. Steam inhalation, hot applications to the neck, and astringent sprays to the larynx, were advised, together with careful watching; both of us recognizing that in *subglottic œdema* we had a more dangerous disease to overcome than in the other form—a disease in which the scarification performed in the other cases which I have detailed would have been impossible, on account of the location of the affection; and, even if possible, would have done no good, on account of the nature (in these special cases) of the effusion. Tracheotomy would be the only surgical resource. Fortunately, it was not required; the child steadily improved, and a few days later was reported to me by the doctor as being quite well. I have not seen it since.

Proceedings of Societies.

NEW YORK PATHOLOGICAL SOCIETY.

Stated Meeting, June 28, 1877.

Dr. E. G. JANEWAY, President.

Urinary Calculus weighing Fifty-One Ounces.—Dr. BRADLEY presented, on behalf of a candidate, a specimen of calculus

which had formed in the pelvis of the kidney. The history was markedly interesting, both in regard to diagnosis and treatment, and was in effect as follows: A woman, aged sixty-three, suffered from symptoms connected with micturition, but not from renal colic. She exhibited to her attendant a bottle containing several hundred urinary calculi, measuring from an inch in diameter down to one-fourth of an inch. These had been passed at intervals during a period of four years. On making a vaginal examination a tumor was detected anteriorly, corresponding with the posterior wall of the bladder. This tumor conveyed to the finger the sensation of being filled with numerous calculi resembling those shown in the bottle. After several days the urethra was sufficiently dilated to admit of the introduction of a pair of uterine forceps, but no calculi could be removed, although the finger was carried along the vagina to guide the direction of the forceps. All attempts at removal were discontinued for several months, and during that time the patient passed several small ones. Finally, the patient was anæsthetized, and the urethra was again dilated sufficiently to admit of an ordinary anal speculum. A steel scoop was passed between the blades of the speculum, but nothing could be discovered. The finger was then introduced, when it was found that there was apparently a cyst containing the stones. This cyst was incised and the finger carried in, but only two small calculi were removed. The discovery was made, however, that a stone of size too large for extraction was present, and that further procedures should be abandoned. As the patient was coming out of the anæsthetic, syncope came on, and, although pulsation and respiration ceased for a time, the patient rallied, but died two days after the operation, from peritonitis.

At the autopsy a rare and interesting condition was brought to light. In the usual position of the bladder, and extending up to the umbilicus, was a tumor, which proved to be the pelvis of the left kidney containing a calculus weighing fifty-one ounces, and upward of five hundred smaller ones. At the lower portion of the sac was an opening an inch in diameter, which was the result of the operation performed.

The dimensions of the large calculus were—length, $6\frac{2}{3}$ inches, greatest circumference, $16\frac{5}{8}$ inches.

Disease of Kidneys in Cats.—Dr. HEITZMANN presented the kidney of a cat which had, during its lifetime, suffered from convulsions. A microscopical examination of the specimen showed it to present evidences of nephritis.

Bibliographical and Literary Notes.

ART. I.—*Cyclopædia of the Practice of Medicine*. Edited by Dr. H. VON ZIEMSEN. Vol. XII. *Diseases of the Brain and its Membranes*. By Prof. H. NOTHNAGEL, of Jena; Prof. E. HITZIG, of Zürich; Prof. F. OBERNIER, of Bonn; Prof. O. HEUBNER, of Leipzig; and Prof. G. HUGUENIN, of Zürich. Translated by HENRY R. SWANZY, M. D., of Dublin; CHAS. EMERSON, of Concord; EDWARD H. BRADFORD, M. D.; ELBRIDGE G. CUTLER, M. D.; ROBERT T. EDES, M. D.; JAS. J. PUTNAM, M. D.; FREDK. C. SHATTUCK, M. D.; S. G. WEBBER, M. D., of Boston; and LOUIS VELLER, M. D., of Elmira. ALBERT H. BUCK, M. D., Editor of the American Edition. 8vo, pp. xii.—902. New York: Wm. Wood & Co., 1877.

THE contributors to this volume of the “Cyclopædia” are all comparatively young men (the oldest being at the present time under forty years of age), and, although contributors to some extent to the medical literature of Germany, they have not, with one or two exceptions, become world-wide in reputation. The several sections must therefore necessarily stand upon their own merits, and are likely to gain but little *éclat* from the names of the writers.

Nothnagel contributes articles on anæmia, hyperæmia, hæmorrhage, thrombosis, and embolism of the brain. The articles seem exhaustive, so far as description is concerned. The differentiation of the several forms of cerebral hæmorrhage is for the most part as satisfactory as can be expected. The author does not speak with much positiveness upon the

localization of the clot, but thinks that, while there is no one symptom pathognomonic of hæmorrhage in any particular locality, by closely observing all the symptoms attending a case, the seat of the clot may ordinarily be ascertained.

We are not a little surprised, however, that the author makes no mention of elevation of temperature as pathognomonic of the existence of a clot in the *pons*. This view is entertained by Bastian,¹ an authority of sufficient weight to entitle the opinion to mention, at least.

Some curious facts are observed from the presence of a clot in certain parts. Thus, when situated in the nucleus lenticularis, paralysis of the opposite extremities and of the opposite side of the face occurs. When the pedunculus cerebri is the seat of the clot, the extremities of the opposite side and the motor oculi of the same side may be paralyzed. Lesions of the corpus striatum usually induce paralysis of the opposite side, with a preponderance in the upper extremity; sometimes it is at first confined to an upper or a lower extremity. The author holds, with Cohn and Meyvert, the opinion that when the thalamus opticus is the exclusive seat of hæmorrhage neither motor-paralysis nor disturbance of the sensibility results. Bastian, who is evidently of the opposite opinion, says that a *persistent* elevation of temperature exists in the paralyzed limb in lesions of the optic thalami. Possibly in his cases pressure upon surrounding parts may have occurred; at all events, the occurrence of this symptom seems to prove, in connection with the fact that general elevation of temperature follows lesions of the *pons*, that there is an inhibitory or repressive heat-centre situated near the *pons*—either in or above it.² Even small extravasations into the third convolution of the cerebrum may occasion aphasia. Other points of equal interest are left out in the discussion.

Obernier, on "Tumors of the Brain and its Membranes," writes in a very terse style, and puts his questions methodically. The differentiation is exceedingly clear.

¹ *Vide London Lancet*, October 31, 1874.

² *Vide* "Four Lectures: IV. A Study of the Nature and Mechanism of the Brain." By H. C. Wood, M. D., 1875.

Heubner writes a good article on "Syphilis of the Brain and Nervous System," which calls for no special comment.

Huguenin occupies about one-half the volume on "Acute and Chronic Inflammations of the Brain and its Membranes." The inflammations of the dura mater are first described, followed by an article of considerable length on "Hyperæmia of the Pia Mater," arachnitis being eliminated.

Of the inflammations of the pia mater, the author considers here "Lepto-Meningitis Infantum" (acute hydrocephalus), "Meningitis Tuberculosa," "Simple Meningitis of the Base," "Meningitis of the Convexity dependent on Neighboring Inflammatory Conditions," "Metastatic Meningitis," "Meningitis of the Convexity due to External and Unknown Causes," and "Traumatic Meningitis." Each of these forms is described in turn, and we may say that the author makes a decided effort in the attempt to differentiate them. The section devoted to the consideration of tubercular meningitis occupies ninety pages, it being, in our estimation, a very exhaustive and excellent article. Huguenin adopts for the most part the recent views of Rindfleisch¹ upon the nature and propagation of tubercle; we think, however, that he falls into error when he claims that absorption of elements from "cheesy foci" is the almost necessary means of spreading miliary tubercle. That absorption of some of the softened elements of scrofulous glands and already-existing miliary tubercles may reproduce the miliary tubercle elsewhere in the system, we do not doubt; but, after the gray deposit is transformed into the yellow tubercle or so-called cheesy nodules, we are inclined to think the danger of further tuberculous infection from those deposits so transformed is ended. A former stage in the change is essential for multiplication, and when the disease is once developed there usually exist a sufficient number of gray tubercular elements in different stages of development or destruction for their propagation.

The yellow deposit, or cheesy nodule, so-called, by softening, occasions: 1. Destructive processes in the lung-tissue; and, 2. Absorption of the softened elements gives rise to a

¹ *Vide* Vol. V. of this "Cyclopædia," or our notice of the same in the number of this JOURNAL for July, 1876.

species of septicæmia. But we deny that there is any proof that absorption of softened yellow tubercle occasions a further deposit of the gray elements. That is to say, we do not believe that the cheesy nodule or yellow tubercle is a caseous pneumonia, or any other pneumonia, the softened products of which constitute "foci" for generating gray tubercle throughout the body; but we hold that the deposit is due to a scrofulous or tubercular cachexia (not necessarily hereditary, but often acquired), and is preceded by the gray or miliary tubercle. This gray tubercle is disseminated only by absorption of the tubercle granule.

The fact that softened "cheesy nodules" frequently accompany the presence of the gray tubercle is no proof that the gray tubercle is occasioned by absorption of the softened matter; but, on the contrary, when the tubercle granules are present without the coexistence of so-called "cheesy foci" in any part of the body, as frequently occurs in tubercular meningitis, we cannot but believe that the gray is the primary deposit. Rindfleisch, if we understand him aright, has adopted this view after repeated microscopical examinations, having previously held the opposite opinion. A study of Flint's analysis of 675 cases¹ very strongly supports this view.

Hitzig contributes the closing section, on "Hypertrophy and Atrophy of the Brain." In this section is considered the "General Paralysis of the Insane."

There is much in this volume that it is pleasant and profitable to read. The translation is first-rate, and fewer clerical errors seem to mar this volume than some of those previously issued.

ART. II.—*The Mortality of Surgical Operations in the Upper Lake States, compared with that of Other Regions.* By EDMUND ANDREWS, A. M., M. D., etc., assisted by THOMAS B. LACEY, M. D. 8vo, pp. iv.—121. Chicago: Hazlitt & Reed, 1877.

It appears that this work is a reprint from the *Chicago Medical Journal and Examiner*, the object of the author be-

¹ "Phthisis," 1876.

ing to answer the following questions in respect to the principal surgical operations :

" 1. What is their risk in the Lake States ?

" 2. What has it been in other regions ?

" 3. What are the opinions and precepts of the principal surgeons of the world regarding each ?

" 4. What conclusions are we to draw for our own guidance ? "

So far as comparative mortality after surgical operations is concerned, the statistics show that, in *amputations* in general in the Lake States, the mortality is somewhat less than in other parts of the world ; *herniotomy* is twice as successful there as elsewhere ; *ovariotomy* presents about the same figures, namely, twenty-eight per cent. in the lake regions against twenty-nine per cent. of mortality elsewhere. The percentage of mortality in *lithotomy* is very much higher in the lake regions ; and *operations upon the windpipe* are attended by a considerably higher rate of mortality than elsewhere.

A very good summary of prevailing opinions in regard to rules for procedures is given in connection with each class of cases. The statistics and conclusions must have required a great deal of care and labor in compiling, for they seem very accurate ; and the brochure will certainly be very convenient and valuable for reference.

BOOKS AND PAMPHLETS RECEIVED. — On the Diagnosis of Urethral Stricture by Bulbous Bougies, with Illustrative Cases. By J. William White, M. D. Reprinted from the *Philadelphia Medical Times*, May 26th.

History of a Case of Recurring Sarcomatous Tumor of the Orbit in a Child, extirpated for the third time, and ultimately causing the death of the patient. By Thomas Hay, M. D. Illustrated. Reprinted from the " Report of the Fifth International Ophthalmological Congress," held in New York September, 1876. Philadelphia: Lindsay & Blakiston, 1877. Pp. 14.

The Question of Rest for Women during Menstruation. By Mary Putnam-Jacobi, M. D., Professor of Materia Medica in the Woman's Medical College, New York. The Boylston Prize Essay of Harvard University for 1876. Illustrated. New York: G. P. Putnam's Sons. 1877.

Eighth Annual Report of the State Board of Health of Massachusetts. January, 1877. Boston: Albert J. Wright, State Printer, 1877. Pp. 498.

On the Use of Large Probes in the Treatment of Strictures of the Urethra. By Samuel Theobald, M. D. Reprinted from the "Transactions of the Medical and Chirurgical Faculty of Maryland," 1877.

Pus in Ovarian Fluids. By James R. Chadwick, M. D. Reprinted from "The Medical and Surgical Reports of the Boston City Hospital," Second Series, 1877.

Calculi found in the Bladder after the Cure of Vesico-vaginal Fistula. By Henry F. Campbell, M. D. Reprinted from vol. i. "Gynecological Transactions," 1876.

Pneumatic Self-replacement of the Gravid and Non-gravid Uterus. By Henry F. Campbell, M. D. Reprinted from vol. i. "Gynecological Transactions," 1876.

Report on Dermatology. By Lunsford P. Yandell, Jr., M. D. Reprinted from the *American Practitioner*, June, 1877.

Report on the Management of the Insane in Great Britain. By H. B. Wilbur, M. D.

Nineteenth Annual Announcement of the Chicago Medical College, for the session of 1877-'78.

Annual Report of the Resident Physician of the New York City Lunatic Asylum, Blackwell's Island, New York, for the year 1876.

An Address delivered before the Alumni Association of Jefferson Medical College, March 9, 1877. By William B. Atkinson, M. D.

Remarks on Sulphate of Quinia. By Alexander H. Jones.

Reports on the Progress of Medicine.

CONTRIBUTED BY DRS. W. T. BULL AND GEORGE R. CUTTER.

SURGERY.

Carbolized Catgut in Hæmorrhage from the Medulla of Bones.—Riedinger employed successfully the catgut No. 3 to arrest bleeding from the medulla of the tibia in a patient sixty-four years of age, who had suffered amputation of the leg at the place of election, for fungous synovitis of the tibio-tarsal joint. Continued pressure with a sponge had no effect. Four ligatures of the catgut were stuffed tightly into the canal; the bleeding stopped at once, and the wound healed without disturbance of any kind. Experiments on dogs proved that the catgut was absorbed after being thrust into holes bored in the compact tissue, as well as when it was put into the medullary cavity.—*Centralblatt für Chirurgie*, No. 16, 1877. W. T. B.

Lympho-Sarcoma of the Prostate.—Dr. Coupland presented to the Pathological Society of London a specimen of this unique lesion. A

policeman aged twenty-nine was treated for five months for cystitis and spasmodic stricture. In the Middlesex Hospital he had these symptoms: Constant desire to urinate; pain across the hypogastrium; and the urine contained stringy mucus and phosphates. A smooth enlargement of the prostate could be felt through the rectum, and the handle of the sound had to be considerably depressed before entering the bladder. The patient died after fifty-four days, from cystitis and suppurative nephritis. The autopsy showed that the prostate was replaced by an ovoidal tumor, as large as a swan's-egg, which was made of "small round and angular cells, completely concealing a fine adenoid reticulum until they were pencilled." Nodules were found also in the pancreas and right supra-renal capsule.—*Medical Times and Gazette*, April 21, 1877.

W. T. B.

Electrolysis in Cystic Tumors.—Ultzmann (*Wiener med. Presse*, No. 42, 1876) concludes, from a series of experiments on cysts of the tunica vaginalis and ovaries, that the electrical current has no power of causing absorption, and that the results obtained with it are due to other reasons. Hydroceles of the size of the fist may be often made to disappear after one application. The process is as follows: The insertion of the needle causes a slight mortification along the line of puncture, which prevents healing *per primam*. By this channel the fluid of the cyst escapes drop by drop, infiltrating the scrotum, and being absorbed by the clothing. This purely mechanical process is favored by the development at the negative pole of oxygen gas, which drives out the fluid; but it takes place only in cysts which contain serous or sero-albuminous fluid. If the cyst-fluid be thick, it will not flow out through the puncture. As a matter of course, moreover, the needle must pass through the cyst-wall; and, in case the cyst contains blood or decomposing pus, like many ovarian cysts, the procedure is dangerous, because the fluid, in oozing out, may cause acute peritonitis. This occurred in one case, and necessitated immediate tapping. Ultzmann asserts that the chemical composition of a fluid is absolutely unaltered by the electrical current. When hydrocele fluid is subjected to diffusion with distilled water, the salts pass into the water, while the albumen remains. The result is the same after the fluid has been exposed to the electrical current, which proves that no change in chemical composition has taken place. Hence the assertion of Fieber and others, that albumen is changed into an albuminate, is incorrect.

The experiments were conducted with a Leclanché battery of twenty-four cells, whose negative pole—a needle of gold or platinum—was thrust into the cyst, and whose positive pole—a sponge-holder—was placed on the skin. The sittings, of twenty to thirty minutes' duration, were had every second or third day.—*Centralblatt für Chirurgie*, No. 14, 1877.

W. T. B.

Wilhelm on Electrolysis and its Advocates (*Wien. Allg. med. Zeitung*, No. 4, 1877).—The author was assistant to F. Fieber, and participated in the latter's experiments in electrolysis. His statement of the results obtained convey a very different impression from those of Fieber. Among the cases cited by him, not one of which was treated with success, the following are the most important: 1. An ovarian cyst (supposed) in a married woman; electrolysis; great dyspnoea, caused by development of gas; tapping, followed by death. The autopsy showed no cyst, but carcinoma of the omentum, with peritoneal dropsy. 2. A man with hydrocele was subjected to twenty sittings with the electrical current; finally, inflammation of the scrotum, and then puncture of the sac. 3. A mucous polyp hanging from the cervix uteri; after six sittings, gangrene of the tumor without separation of the same, followed by a severe metritis and parametritis, leaving a firm pelvic exudation which completely surrounded the uterus. 4. A præpatellar hygroma; after several sittings, an acute

synovitis of the knee-joint ensued, the treatment of which lasted some weeks; the fluid in the bursa was somewhat diminished. 5. Ganglion of the extensor tendons, to which the electrolytic treatment added an intense inflammation of the sheaths of the tendons, with lymphangitis of the whole arm. The duration of treatment was six weeks. An ovarian cyst, reported by Fieber to have been cured by electrolysis, was later under treatment by another electro-therapeutist, and cured a second time. In cases of carcinoma uteri, ulcers of the leg, and polypi of the larynx, no effect was observed beyond some gangrene of tissue at the point of insertion of the needle. Wurtz's solution of albumen was not altered in chemical composition by the use of the electrolytic apparatus. Some hypertrophied glands are said to have diminished in size. The above cases show at least that electrolysis is by no means a harmless method of treatment.—*Centralblatt für Chirurgie*, No. 16, 1877. W. T. B.

THEORY AND PRACTICE.

Scarlatina Relapses.—Many authorities admit, while others deny, the return of scarlet fever, but the number of the former exceeds that of the latter. Robert Koerner (*Jahrb. f. Kinderheilkunde*, Bd. ix.) distinguishes the pseudo-relapses from the true and the returns of the disease. The *false* relapses occur during the continuance of the fever, about the second or third week, and consist of an exanthema of true scarlatina. The celebrated Borsieri had already observed that the eruption often returned after a few days, but without being accompanied by the grave phenomena which marked the commencement of the first attack. The *true* relapse, however, occurs when the first disease has already passed off, during the period of desquamation. During the convalescence there is a new attack of scarlatina with all its characteristic symptoms. Sometimes this relapse assumes a recurrent form (Trojanowski). The true relapse ordinarily occurs in children of seven to fourteen years, toward the end of the third week, and may be of greater or less intensity. It generally terminates in recovery, but fatal cases have been seen (Eisenmann). Thomas has seen three cases of relapse in one family. Finally, there is a third mode of return of scarlatina, the *second attack*, or *return*. It is when, after the cure of the first scarlatina, or, indeed, some considerable time later, a new scarlatinous exanthema is noticed. The author having collected seventy-nine cases of this form adduces the fact that the first attack generally occurs in children of ten years, and the second from two to six years later, rarely sooner than a year; and, finally, that the return is not always more benign than the first attack, but is sometimes more grave, and terminating in death.—*Lo Sperimentale*, No. 5, 1877. G. R. C.

Corrosive Sublimate formed in a Mixture of Calomel and Sugar.—When calomel comes in contact with powdered white sugar or calcined magnesia, a certain quantity of corrosive sublimate is formed in twenty-four hours. Dr. Polk has observed all the phenomena of corrosive-sublimate poisoning produced by the administration of a mixture of calomel and sugar, which had been prepared for a month. The examination of a portion of this mixture proved the presence of a notable quantity of bichloride of mercury. In the *Journal of Pharmacy and Chemistry* of Turin, November, 1875, the same fact is noticed. In this case the poisoning was caused by pastils containing calomel. The pastils were made with sugar, which acted as an organic matter on the calomel, and transformed it into bichloride of mercury. The proportion of the sublimate

increases with the period passed since the preparation of the pastils.—*Osservatore Med. Siciliano*, No. 2, 1877. G. R. C.

Poisoning by Santonine.—A child, two years of age, having eaten two pastils of chocolate containing ten centigrammes of santonine, presented symptoms of poisoning. Binz then made some experiments on animals. He injected santonine into the subcutaneous cellular tissue of frogs, and produced convulsions. He found that a larger dose was necessary in rabbits and frogs than in man to produce the symptoms of poisoning, which always commenced to manifest themselves in the nervous system. Hydrate of chloral and ether by inhalation have been proposed by Becker as the best antidotes.—*Mov. Med. Chir. di Napoli*, No. 16, 1877.

G. R. C.

Miscellany.

Appointments, Honors, etc.—Dr. John Ashurst, Jr., has been elected Professor of Clinical Surgery in the University of Pennsylvania. Dr. James Tyson has been appointed temporary incumbent of the chair of Physiology in the same school. Prof. T. J. Heard has resigned the Chair of Materia Medica and Therapeutics, and Clinical Medicine, in the Medical Department of the University of Louisiana, and Prof. J. B. Elliot has been elected to fill his place.

Dr. Peacock has resigned his appointment as Senior Physician to St. Thomas's Hospital, and will probably be succeeded by Dr. Ord. Prof. George Macleod is to succeed Prof. Lister as Surgeon to the Queen in Scotland. Sir Robert Christison has resigned the Chair of Materia Medica in the University of Edinburgh. Mr. Henry Smith, F. R. C. S., has been appointed Professor of Systematic Surgery in King's College, succeeding Prof. John Wood. Mr. G. D. Thane has been elected Professor of Anatomy in University College, London, in place of Prof. Ellis, resigned. Dr. Hooker has been made a Knight Commander of the Star of India. A course of lectures by Dr. Brown-Séquard to the medical profession of Liverpool was announced to take place last month. Dr. W. H. Allchin has been elected physician to Westminster Hospital, in place of Dr. Basham, resigned.

Substitute for the Tourniquet.—It has been customary to furnish workmen on English railroads with tourniquets for use, in case of accidents involving hæmorrhage, until medical

aid could be obtained. On the London & Northwestern Railway, for the past fifteen months, elastic tubes have been substituted for the tourniquets, with such excellent results that large additional supplies have been ordered. The tube terminates in a hook at each end, and is simply applied while stretched, and the hooks fastened to each other. The advantage seems to be that much less skill is required in the use of the tube than in the application of the tourniquet, and that it is more certain in its action.

The Kansas State Medical Society.—At the annual meeting held in Lawrence, May 9th and 10th, the following officers were elected: President, W. L. Schenck, of Osage City; First Vice-President, C. C. Furley, of Wichita; Second Vice-President, J. H. Stuart, of Lawrence; Secretary, F. D. Moss, of Lawrence; Assistant Secretary, V. Biart, of Leavenworth; Treasurer, W. W. Cochran, of Atchison; Censors, H. O. Hanawalt, Arvonja; H. S. Roberts, Manhattan; G. R. Baldwin, Fort Scott; G. L. Sears, Atchison; P. O'Brien, Topeka. The Society adjourned to meet in Topeka on the second Wednesday in May, 1878.

The Iowa State Medical Society.—The annual meeting was held in Cedar Rapids June 6th and 7th. About one hundred and fifty members were present, and some valuable papers were read and discussed. The following officers were elected for the ensuing year: President, Dr. H. Ristine, Cedar Rapids; First Vice-President, J. W. Gustine, Carroll; Second Vice-President, L. P. Fitch, Charles City; Secretary, J. F. Kennedy, Des Moines; Assistant Secretary, G. O. Morgridge, West Liberty; Treasurer, G. R. Skinner, Cedar Rapids.

International Medical Congress.—The next meeting of this Congress will be held in Geneva, September 9th. The subjects of essays and discussions are arranged under six heads, viz.: Medicine, Surgery, Gynecology, Public Medicine, Biology, and Ophthalmology. Many distinguished gentlemen have promised contributions. There will also be an exhibition of surgical and other instruments and appliances.

Hospitals for those who can pay.—What is called the Home Hospital Association has been organized in London for the purpose of providing comfortable hospital accommodation, with skilled nurses, in various parts of London, for the benefit of patients who can afford to pay for such advantages. Such hospitals will not only be a great convenience to the public, but will prevent the abuse of charities intended only for the poor.

A German Gynecological Society.—A committee appointed by a large number of obstetricians, consisting of Profs. Credé, of Leipsic, Hecker, of Munich, and Hegar, of Freiburg, have announced that a meeting to organize a German Gynecological Society will be held at Munich September 15th and 16th. The Society will at once proceed to business, and many papers are already promised.

Prof. Dittel on Lister's Method.—Prof. Dittel, having employed Lister's method strictly in 129 cases, has come to the conclusion that it is unsuitable in wounds where thick, fatty flaps are to be united, and in diseases in the substance of bone. In the majority of cases he believes it to be the best method that can be employed.

A United Special Hospital.—A scheme is on foot in London for the establishment of a large hospital composed of separate departments, each devoted to special diseases. It is thought that in this way one general medical staff may be able to superintend the whole institution, and that the material may be rendered more valuable for purposes of clinical instruction.

The Canadian Medical Association.—The annual meeting of this association will be held in Montreal September 12th, under the presidency of Dr. Hingston. Dr. David, of Montreal, is Secretary, and will be glad to receive communications from those intending to take part in the proceedings.

Long Island College.—At the commencement exercises of this college, held June 21st, thirty-four gentlemen received the degree of Doctor of Medicine. The address to the graduating class was delivered by Rev. J. B. Thomas, and the valedictory by Dr. H. H. Kane.

Army Intelligence.

Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from June 14 to July 13, 1877.

HEAD, J. F., Lieutenant-Colonel, Surgeon, and Medical Director.—Granted leave of absence for one month. S. O. 121, Department of the South, June 16, 1877; and leave extended one month. S. O. 135, Division of the Atlantic, June 21, 1877.

SWIFT, E., Lieutenant-Colonel and Assistant Medical Purveyor.—Relieved from duty as Medical Director of Department of the Gulf, to proceed to New York City and relieve Colonel Chas. Sutherland, Surgeon, of the charge of the Medical Purveying Depot in that city. S. O. 147, A. G. O., July 6, 1877.

BAILY, J. C., Surgeon.—Assigned to duty as Post-Surgeon at Benicia Arsenal, Cal. S. O. 66, Division of the Pacific and Department of California, June 15, 1877.

GRAY, C. C., Major and Surgeon.—Assigned to duty at Fort Riley, Kans. S. O. 115, Department of the Missouri, June 16, 1877.

BACHE, D., Surgeon.—In addition to his present duties, to attend the sick at Alcatraz Island, Cal. S. O. 68, Division of the Pacific and Department of California, June 20, 1877.

STERNBERG, G. M., Major and Surgeon.—Telegraphic instructions of 19th inst. to proceed, with ample medical supplies, with Companies B and H, Twenty-first Infantry, from Fort Walla Walla, to Lewiston, Idaho. Confirmed. S. O. 86, Department of the Columbia, June 29, 1877.

WOLVERTON, W. D., Major and Surgeon.—Assigned to duty at Fort A. Lincoln, D. T. S. O. 77, C. S., Department of Dakota.

MIDDLETON, J. V. D., Major and Surgeon.—Assigned to duty at Fort Schuyler, N. Y. H. S. O. 139, C. S., Division of the Atlantic; and granted leave of absence for two months. S. O. 140, Division of the Atlantic, June 26, 1877.

WOODHULL, A. A., Major and Surgeon.—Relieved from duty at Alcatraz Island, Cal., and assigned to temporary duty at Camp Halleck, Nev. S. O. 68, C. S., Division of the Pacific and Department of California.

BROOKE, J., Captain and Assistant Surgeon.—To accompany Second Infantry to the Department of the Columbia, and, upon completion of that duty, return to his present station, unless otherwise ordered. S. O. 133, Department of the South, July 7, 1877.

WHITEHEAD, W. E., Captain and Assistant Surgeon.—Assigned to duty at Fort Larned, Kans. S. O. 115, C. S., Department of the Missouri.

KINSMAN, J. H., Captain and Assistant Surgeon.—Assigned to duty as Post-Surgeon at Jackson, Miss. S. O. 114, Department of the Gulf, July 4, 1877.

VICKERY, R. O., Assistant Surgeon.—Assigned to temporary duty at Fort Schuyler, N. Y. H. S. O. 142, Division of the Atlantic, June 28, 1877.

DE WITT, C., Captain and Assistant Surgeon.—Assigned to temporary duty at Omaha Barracks, Nebr. S. O. 87, Department of the Platte, June 26, 1877.

MOFFATT, P., Captain and Assistant Surgeon.—Assigned to duty at Fort Mackinac, Mich. S. O. 131, C. S., Division of the Atlantic.

ELBREY, F. W., Captain and Assistant Surgeon.—To accompany Second Infantry to Idaho Territory, and upon completion of that duty to return to his present station, unless otherwise ordered. S. O. 133, C. S., Department of the South.

SEMIG, B. G., First Lieutenant and Assistant Surgeon.—Assigned to temporary duty at Camp McDermitt, Nev. S. O. 76, Division of the Pacific and Department of California, June 29, 1877.

MATS, L. M., First Lieutenant and Assistant Surgeon.—Assigned to duty at Standing Rock Agency, D. T. S. O. 77, C. S., Department of Dakota.

REED, W., First Lieutenant and Assistant Surgeon.—Assigned to duty at Camp Apache, A. T. S. O. 66, Department of Arizona, June 26, 1877.

HALL, W. R., First Lieutenant and Assistant Surgeon.—Telegraphic instructions of 20th inst. to accompany troops on board steamer California to Lewiston, Idaho, for field service. Confirmed. S. O. 86, C. S., Department of the Columbia.

TORNEY, G. H., First Lieutenant and Assistant Surgeon.—Assigned to duty at Fort Gibson, Ind. T. S. O. 125, Department of the Missouri, July 5, 1877.

GARDINER, J. B. W., First Lieutenant and Assistant Surgeon.—Assigned to duty at Camp Lowell, A. T. S. O. 66, C. S., Department of Arizona.

NEWLANDS, W. L., First Lieutenant and Assistant Surgeon.—To report to Major Geo. B. Sanford, First Cavalry, for duty with his command. S. O. 68, C. S., Division of the Pacific and Department of California.

Obituary.

PROF. CAVERTON.—The death of this distinguished chemist, at the age of eighty-two, is announced in the French journals. He was elected a member of the Academy of Medicine of Paris in 1823, and his name was made famous at a very early age by his isolation of a large number of alkaloids and active principles, and in 1820 by the discovery of quinine. Shortly afterward he discovered strychnine, brucine, and cafein. He was appointed Professor of Toxicology in the École de Pharmacie in 1826, and filled the chair with great success for a period of thirty years.



Fig. 4 shows a later stage than Fig. 2. Pus is present in great quantity outside the fundus of the follicle, and the follicle-sheaths and external root-sheath are partly broken down. Toward the neck of the follicle the changes are less and less. The cells of the root of the hair were more granular than normal, showing the commencement of the retrograde metamorphosis. This drawing shows exceedingly well the primary changes in the disease to be a peri-folliculitis.

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[No. 3.

Original Communications.

ART. I.—*Sycosis*. By ANDREW R. ROBINSON, M. B., L. R. C. P. and S., Edinburgh, Special Pathologist to the New York City Asylum for the Insane; Member of the New York County Medical Society, the New York Dermatological Society, and of the American Dermatological Association, etc.

(Concluded from August Number.)

I WILL now describe the various pathological changes which take place in this disease, and show the incorrectness of the views of the authors I have quoted. I will first describe the changes which take place in a case of sycosis, uncomplicated by an eczema or dermatitis.

The first changes which take place occur around the follicle, in the peri-follicular region. The usual changes which occur in vascular connective-tissue inflammations are here met with. An increased amount of blood is sent to the peri-follicular region, and the blood-vessels of the part become dilated and filled with accumulated blood-corpuscles. Some of those escape (pass outward), and directly pus-corpuscles (previously white blood-corpuscles) are found outside the vessels, especially around the base of the follicle; but scattered corpuscles

are found lying as high as its neck. Sometimes a rupture of a blood-vessel occurs very early in the disease, and a greater or less quantity of red blood-corpuscles appear in the neighborhood of the ruptured vessel. In one case the blood-vessel of the hair-papilla was ruptured, and the papilla partly filled with extravasated red blood-corpuscles (see Fig. 1). As occurs



FIG. 1 is a section through the hair-bulb, on a level with the papilla, and represents the earliest stage in the disease. The blood-vessel of the papilla is ruptured, and blood-corpuscles have been extravasated. The cells forming the hair-root are still perfectly normal, but pus-corpuscles are present in the peri-follicular region. From a case of uncomplicated sycosis.

in any similar inflammation, the pus-corpuscles rapidly increase in number, either by the outwandering of more white blood-corpuscles from the vessels, or from division of those already outside, or by both processes combined, and soon surround the base of the follicle; while along its sides, between the fundus and the neck, the blood-vessels are much dilated,

though only few pus-corpuscles are found in the tissue surrounding them (*see* Fig. 4). With this outwandering of formed elements there is the usual transudation of serum, which penetrates the tissue and the hair-follicle; but, beyond the action of this transuded fluid upon the follicle, there is not any change to be observed in the latter structure in the earliest stage of the disease. The changes, therefore, which occur during the early papular stage, take place primarily in the tissue surrounding the follicle, and show that the disease in the first stage is not a folliculitis, but a peri-folliculitis, *pure et simple*. As the inflammation proceeds and more pus and serum collects, the follicle and its sheaths become more and more affected. The latter become softened and more or less destroyed, and a portion of the surrounding pus may enter the follicle through the ruptured sheaths (*see* Fig. 2). The changes which occur

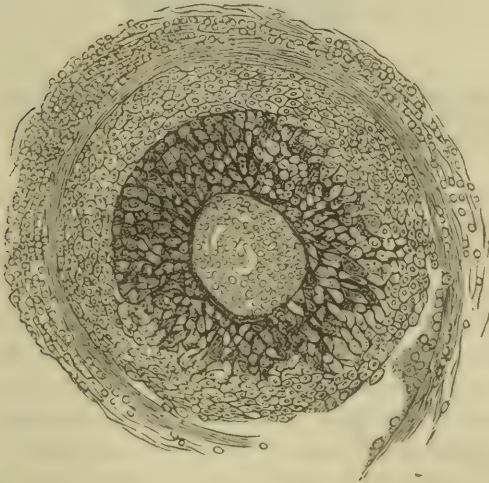


FIG. 2 represents a little later stage than Fig. 1. A large number of pus-corpuscles were present around the follicle, and the follicle-sheaths are ruptured. The cells of the hair-bulb are commencing to break down. This section is also made through the hair-root on a level with the papilla, and from a case of uncomplicated sycosis. The central part is the papilla, the next is the hair-root, and the external connective-tissue structure the follicle-sheaths.

within the follicle, prior to the rupture of its sheaths, are principally attributable to the increased amount of serum present. The cells of the external root-sheath become swollen, and some

of the cells begin to break down. Similar changes occur simultaneously in the cells of the hair-root. Here the cells forming this part of the hair are soft, contain much protoplasm, and are therefore easily affected by external agents. They swell, the protoplasm becomes granular, their margins become indistinct, and there is evidence of commencing destruction. If the serum is rapidly effused, the cell bodies and their

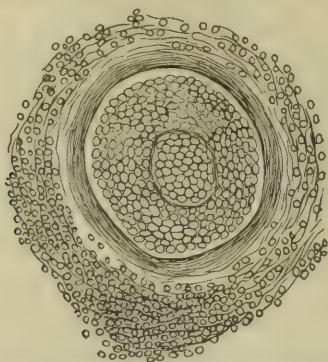


FIG. 3 is also a section from the same situation as the preceding ones, but is from a case complicated with eczema. Both the papilla and the root of the hair seem to be composed of round cells. In the papilla such is the case, but the appearance in the root of the hair is from the action of the serum on the cells of the part.

connecting substance may become indistinct, and only round bodies appear where the epithelial-like cells of the hair-root previously existed. This change occurs especially in cases complicated with acute eczema or dermatitis. After the rupture of the follicle-sheaths, or even before, the cells of the hair-root and of the external and internal root-sheaths become rapidly broken up and changed by the serum which has entered the follicle, accompanied occasionally by the pus from the blood-vessels. If pus has entered them, the hair-root is infiltrated with a sero-purulent fluid. Very frequently, however, no pus enters the follicle, and then all the changes which occur in the follicle are caused by the serum alone. The cells of the external and internal root-sheaths undergo destructive changes, the cell-bodies and connecting substance are gradually destroyed, and a granular-looking mass containing roundish bodies (the nuclei of the former cells) is formed. This change is shown in Fig. 5, which repre-

sents the changes always found in the whole length of the external root-sheath in ordinary cases of sycosis. The cells of the hair-root undergo exactly similar changes to that of the external root-sheath, and at an earlier period than that portion of the sheath seated near the surface of the skin.

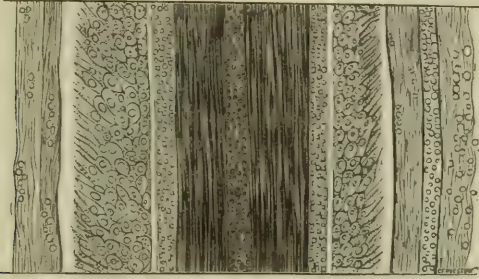


FIG. 5 represents a later period in the pustular stage. The cells of the external root-sheath and the soft parts of the hair are changed in the manner described in the text. I have here drawn only the portion of the shaft of a hair, but similar changes extend the entire length of the hair. It is in this stage, when all connection is severed between the external root-sheath and the follicle-sheaths, that the hair lies loosely within the follicle, and can be extracted easily and without producing pain.

There is usually no purulent infiltration of the root; the appearance of pus-cells is deceptive; the round cells seen in the broken-down granular mass are the nuclei of the normal cells of the part. This can only be decided by sections through the hair-root, as examining the root of a hair extracted entire leads to the view that pus-cells are present in great number within the follicle. In this the pustular stage of the disease, the principal changes take place within the follicle; and, if a hair is extracted in this stage, it is found that the hair-root and the external and internal root-sheaths are broken down, and no longer possess their normal characters. The external root-sheath and the root of the hair exhibit the changes shown in Fig. 5, only that the root is more changed than the sheath. The shaft of the hair being hard, and the serum consequently unable to act upon it, retains its normal character. As the disease progresses, the connective tissue around the follicle becomes infiltrated with pus-cells as far as the surface of the skin, and softened. If the hair is allowed to remain within the follicle until expelled by the accumulating pus, the external and internal root-sheaths and soft parts of the hair become

completely destroyed, and only the hard part of the hair remains.

The follicle-sheath and the connective tissue in the perifollicular region are more or less destroyed, and the Malpighian layer becomes ruptured on a level with the upper part of the neck of the follicle. The pus reaches the surface by breaking through the Malpighian layer, and does not pass between the hair-shaft and the follicle-sheath, as mentioned by Wertheim. When the follicle-sheaths are destroyed, and there is free connection between the peri-follicular pus and the follicle, a portion of the pus does pass to the surface through the space previously occupied by the external and internal root-sheaths. In extracting a hair during the pustular stage, sometimes the follicle-sheaths accompany the hair, but generally they do not. The cells surrounding the hair-papilla, and from which the hair is formed, seem to resist the inflammatory process longer than the other cells of the bulb, a circumstance which explains why permanent alopecia is not a more frequent consequence of sycosis. The cavity left after the extraction of a hair in sycosis, in a case in which the follicle is not completely destroyed, contains pus along the entire length of its walls and at its base, and the follicle sheaths are more or less destroyed. The structures, however, forming the base of the follicle are not completely destroyed, the papilla remaining, from which a new hair will grow. In those cases in which permanent alopecia results, pus is present in the cavity as in the former case, but the follicle sheaths and the base of the follicle are completely destroyed, making it impossible for a new hair to grow, as there is no longer a papilla from which it can be formed. Such a cavity is represented in Fig. 6. Here all the follicle structures have been completely destroyed. Such a cavity becomes obliterated by new-formed connective tissue forming a cicatrix. The whole process, therefore, in simple, uncomplicated sycosis is, first, a peri-folliculitis, then the follicle elements are acted upon by the inflammatory products, and notably by the serum, which causes destructive changes in the soft parts of the hair, and in the external and internal root-sheaths, by which their cells are so acted upon that the cell-body and connecting substance are first destroyed, and a granu-

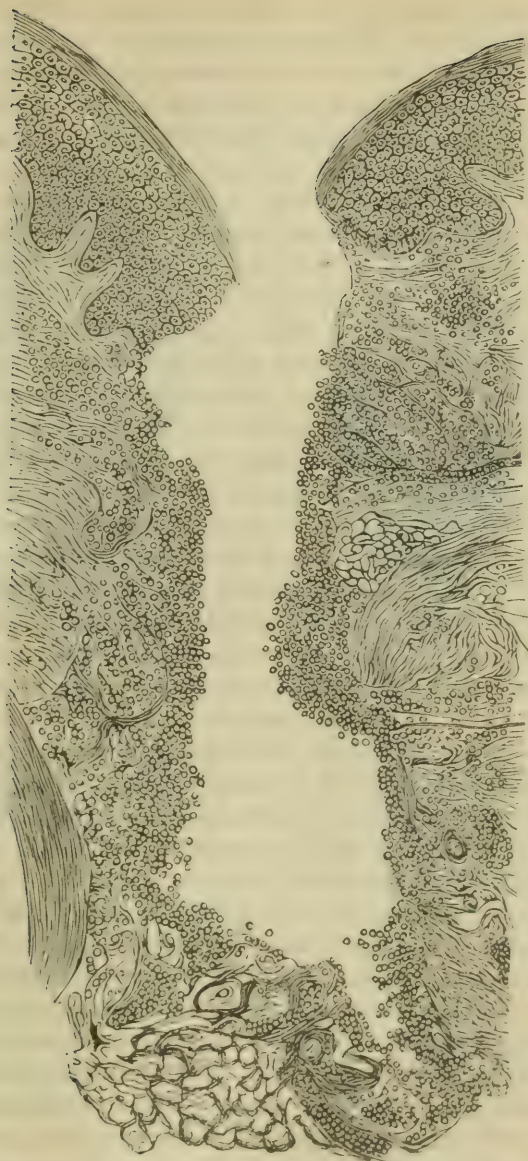


FIG. 6 shows the nature of the cavity left in the skin after expulsion of a hair in the latest stage of the disease, and where the destructive process had proceeded so far that the follicle is completely destroyed. There is no trace to be seen of any of the structures belonging to the follicle. Such destruction always produces permanent alopecia.

lar mass containing round bodies, the nuclei of the fixed cells of the part, results. If the process continues a length of time, the round bodies also become destroyed, and a detritus only remains. In this latter stage, only the hard, corneous part of the hair remains of the structures which previously made up the hair and its sheaths. In those cases of sycosis in which the inflammation extends from the surface, as when an eczema is present, the changes do not differ in any essential way from that just described, only that the external and internal root-sheaths and follicle-sheaths are acted upon in their entire length at the same time, while in simple sycosis the sheaths at the root of the hair are first affected, and the inflammation travels upward. If a general dermatitis is present, as in erysipelas, the follicle-structures become frequently changed in the same manner as in sycosis; but, as the limited perifollicular inflammation is absent, the same clinical appearances are not presented. This is a proof that the changes within the follicle are produced from without, but it requires the perifollicular inflammation to constitute sycosis. A hair will therefore present different appearances, according to the stage of the disease at which it is extracted. If a healthy, normal hair is extracted, it is found that the external root-sheath does not accompany it. This would also be the case in the earliest stage of sycosis, before the follicle is affected. If, however, we examine a hair extracted during the pustular stage, it will be found covered with the root-sheaths in different stages of destruction, according to the duration of the disease and the activity of the inflammation. In an early part of the pustular stage the bulb is swollen, and infiltrated with a serous, and sometimes a sero-purulent fluid. The root-sheaths will also be more or less destroyed. If the hair remains within the follicle until expelled by the accumulated pus, the destruction will have proceeded still further, the external and internal root-sheaths, and the soft parts of the hair, become destroyed, and nothing but the hard part of the hair remains intact. The sebaceous glands, being seated so near the hair, and being richly supplied with nerves and blood-vessels, may also become affected, though not at so early a stage of the disease as the fundus of the hair. Similar changes occur here to those in

the cells of the external root-sheath. The endothelial cells become swollen, their margins indistinct, the protoplasm becomes more coarsely granular, and the cells become more or less destroyed. An early stage of these changes is seen in Figs. 7 and 8. The manner in which the connective tissue



FIG. 7 represents an early stage of the changes which sometimes occur in the sebaceous glands. They become surrounded with pus, and the endothelial cells undergo the changes I have described.



FIG. 8 shows the changes which occur in the sebaceous glands when they become entirely destroyed, as occurs in those severe cases of the disease which resemble a lupus in their results. The gland is surrounded with pus-cells, and the endothelial cells become changed to a granular mass containing fat-drops.

and its cells and the different gland elements are destroyed, differs in no respect from the process of molecular retrograde metamorphosis of the different tissues, as given in works on pathological histology, consequently is not peculiar to sycosis, and need not be here further described. The sweat-glands, when affected, show similar changes, though these structures possess considerable immunity against external agents. In Fig. 9 the cells show commencing degeneration from the transuded serum. If, however, but little serum is present, as in some cases of chronic sycosis, the cells of the sweat-glands can remain normal even when surrounded with pus.

The changes which I have thus far described take place in cases of ordinary sycosis, and the results of the inflammation,

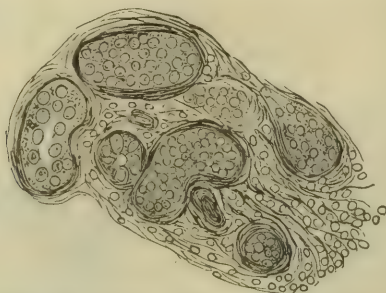


FIG. 9 gives the changes which are met with when the sweat-glands are surrounded with a considerable amount of serum.

even when of long standing, are nothing more than a temporary or permanent partial alopecia. In those severe cases, however, which resemble in their effects mild cases of lupus, the retrograde changes proceed further, and there is more or less destruction of the hair-follicles, sebaceous and sweat glands, and of the other tissues of the affected part, and healing by cicatricial tissue. The inflammatory changes do not differ much from those which take place in simple sycosis; but the inflammation is more diffuse and chronic in its course. Pus collects in the epidermis and cutis, and those tissues are destroyed in the same manner as the follicle-tissue. The sweat-glands offer considerable resistance to the process, and consequently remain longer normal than the sebaceous glands (*see* Fig. 10). In Fig. 9 is shown a sebaceous gland almost completely destroyed by the retrograde metamorphosis. The connective tissue shows all the changes of a retrograde process, as destruction of the connective-tissue bundles and the cells and nuclei of the part.

We thus learn that, in sycosis, the first changes take place in the peri-follicular region, and that the subsequent changes which occur within the follicle are due to the inflammatory process which has its origin in the surrounding tissue. There is never any change whatever to be observed in the cell-elements proper of the follicles previous to the changes taking

place in the tissue surrounding them, i. e., the disease is primarily a peri-folliculitis.



FIG. 10 shows the resistance the sweat-glands offer to pathological processes. Pus-corpuscles may be present in great number, as in this case, but, unless the quantity of serum is also abundant, the cells of the sweat-glands retain a long time their normal character.

To constitute an idiopathic inflammation of the hair-follicles, the primary morbid changes must take place in the elements of the hair or its follicle. In acne the first abnormal changes are supposed to take place in the cells of the sebaceous gland, or in their secretion, and any peri-glandular inflammation that may arise is secondary, and caused by the process which has taken place within the gland. If this view of the process in acne is correct, then the disease is, properly speaking, an affection of the sebaceous glands. In sycosis, however, the peri-follicular inflammation is not caused by any process occurring within the follicle, since the elements of the latter are perfectly normal until invaded by the inflammation from without. Even then those elements do not take an active part in the inflammation, and increase, and divide, as stated by Köbner, but are simply more or less broken up and destroyed, in the manner I have already described, by the inflammatory products from the blood-vessels passing into the follicle. A study of the whole process shows, therefore, that the disease is not primarily an inflammation of the hair-follicles, as has been generally believed, but a peri-follicular dermatitis.

Etiology.—Having completed the study of the nature of the disease, I will now proceed to discuss its cause. In the

majority of cases, an eczema or superficial dermatitis precedes, and is to be regarded as a predisposing cause of, the disease. Sometimes, though there is no active inflammation present, the skin is harsh, red, and irritable. A temporary superficial irritation of the skin rarely, if ever, produces sycosis of the beard, provided the skin is otherwise in a normal condition and the health of the patient good. When the hairs are not deeply seated, as, for instance, on the scalp, a superficial inflammation frequently extends to the follicular region, and produces all the changes peculiar to sycosis. In many cases of the disease, however, there has been no previous dermatitis, either of a catarrhal or other form, and even those parts of the skin situated between the pustules appear to be normal. In acute cases the eruption generally appears on limited areas, and is ushered in with pain and swelling of the part where the eruption will appear. Even when thus appearing, with acute symptoms, and on limited areas, a peri-folliculitis does not occur around every follicle situated within the affected area, but only surrounds a limited number.

In chronic sycosis the pustules are more isolated, and appear on different parts of the beard, with the same outbreak. However, whether the pustules are isolated or collected, and whether ushered in with acute symptoms or not, they do not appear continuously, but periodically, that is, the eruption appears in successive "outbreaks," with an interval of generally from seven to fourteen days between the successive attacks. I recall those clinical characters of the disease, as they will assist us greatly in studying the cause of the disease. In those cases where an eczema is present, the disease has been regarded by some writers as simply an extension of this disease to the peri-follicular region, without being influenced by anything which has occurred in the latter location. This is true of the majority of cases of blepharo-adenitis and sycosis, seated within the nose or on a part of the body such as the scalp, where the follicles lie near the surface of the skin, but such is rarely the cause of the disease when located in the bearded part of the face, where the follicles are so deeply seated. In the acute cases, when the eruption is on a limited area, the peri-folliculitis does not surround all the follicles, but only a

few, and those often the deeply-seated ones, which would scarcely occur if the peri-folliculitis were simply an extension of the superficial eczematous inflammation to the deeper-lying tissue. In a case of sycosis of the scalp, once under my care, and which was preceded and accompanied by an eczema of this region, nearly every follicle of the affected part was surrounded by the inflammation, and the follicles changed. In this case, and in similar ones, the sycosis was caused by the simple extension of the eczematous inflammation, first to the peri-follicular region and then to the follicles, and it ceased to exist as soon as the eczema disappeared. The superficial situation of the hair-follicles in this region favors an extension to them of the inflammation. By the use of croton oil, a sycosis can be produced on the scalp, in which all the changes I have described as taking place around and within the follicles occur. In chronic sycosis, where eczema is frequently present, the pustules are generally isolated, and few in number. If the disease were simply an independent extension of the eczema, it is probable that a greater number of pustules would be present, that they would be more collected, that there would be more general infiltration of the skin between the pustules, and, finally, that pus would be always found surrounding the neck of the follicle as early in the disease as it appears around the base. None of those conditions, however, are present, and the absence of the last-named one is proof absolute that the peri-folliculitis is not an independent extension downward of the eczema. Such a view could not be maintained one moment for those cases of sycosis where no eczema is present.

There must, therefore, be some exciting cause why this inflammation is limited to the peri-follicular region, and attacks only a limited number of follicles, and I will now endeavor to show that the direct cause is to be found in the irritation produced by the stiff hairs of the beard on the irritable skin-tissue. In cases of chronic sycosis, the skin is in an irritable condition, and especially the peri-follicular region, on account of its rich supply of blood-vessels and nerves. Such a part, when in this condition, easily inflames when irritated, and in the hairs of the beard we have a body so stiff that they can act like so many spears on the morbidly-sensitive skin. That movement of

hairs causes great pain, when the skin is inflamed or tender, is common experience, and when they are stiff, like those of the beard, they can certainly produce a peri-folliculitis when this region is already irritable, especially when we bear in mind that traction upon a hair seated in a papule which is beginning to subside is sometimes sufficient to cause active inflammation in the latter again, and to become a pustule. The hairs, however, must be stiff or they cannot sufficiently irritate hence the rarity of a peri-folliculitis around fine hairs of the beard, at any period of life, and the still greater rarity of sycosis on those parts of the body supplied with fine hairs only. An eczema may, and often does, continue on those parts of the body, and the skin is in an irritable condition, but no peri-folliculitis occurs, as the hairs are not stiff enough to inflame the tissue. The reason, also, we have isolated pustules in sycosis of the beard is, that only a limited number of hairs irritate sufficiently to produce a peri-folliculitis. It is only the older and stiffer hairs of an affected part that are surrounded with inflammation, a proof, I think, that the exciting cause of the disease is the irritation produced on the irritable tissue by those bodies increasing the condition present sufficiently to cause actual inflammation. This irritation from movement of the hairs is not sufficient to produce inflammation in a healthy individual with normal skin, or sycosis would be a more frequent disease than it is. The skin, however, does not require to be actually inflamed before the hairs can cause a peri-folliculitis around them, for, as I have already said, sycosis sometimes occurs when no dermatitis is present. It must, however, be in an irritable condition, and as it is more irritable at one period than at another, and generally at somewhat regular intervals, this explains the periodical outbreak of the tubercles and papules, as at those times less irritation from the hairs is required to produce a peri-folliculitis.

The fact of the rare occurrence of sycosis on those parts of the body covered with fine hairs, when the part is affected with eczema, or in an irritable condition, is sufficient proof that upon the nature of the hair depends the presence of the disease. Therefore, while the inflammation around the follicles may be regarded as an independent extension of the inflammation from

the seat of the eczema, it can be regarded as purely such only in those cases where the hairs are so fine that they cannot produce much irritation. In this case almost all the follicles are affected, and especially those lying most superficially. Usually, however, only a limited number of follicles are affected, and those the deeper-lying ones, from which old and stiff hairs are produced. Such hairs irritate the skin at the base of the follicle, and then the inflammation can extend to this region from the surface.

But, when no actual inflammation is present previous to the appearance of the eruption, and the skin is simply irritable, the first active inflammatory changes occur around the follicles, and are brought about by the irritation from the stiff hairs. Therefore, in cases of sycosis of the beard combined with eczema, the inflammation may extend from the surface to the follicular region; it, however, is not an independent extension, but is caused by the irritation produced at the follicles by the stiff hairs of the part. Remove the hairs and no peri-folliculitis will occur, as the part will no longer be irritated. I consider, therefore, that in no other manner can the occurrence of sycosis on a part free of eczema, and provided with normal hair, be satisfactorily explained than by supposing the skin to be in an irritable condition, and that the hair is capable of increasing this irritation sufficiently to produce a peri-folliculitis, though not a general dermatitis. When eczema is not present, we must seek for other causes to produce this irritability, and they are found among the various mechanical and chemical irritants which predispose to the disease.

Nearly all writers agree that such things as constant exposure of the face to strong rays of heat, or occupations with dusty and irritating substances, can, and frequently do, produce the disease. In fact, as Tilbury says, "any local irritant can produce it, if the person is out of health, by rendering the skin irritable." Shaving, especially with a dull razor, acts in this way, as it produces great irritation of the skin, though Hebra is inclined to regard shaving rather as a prophylaxis against the disease than a cause of its production. Hebra, however, stands almost alone in this opinion, and the

statement that he has met with sycosis more frequently among persons who never shave, such as the Polish Jews, than among those who shave daily, admits of easy explanation. It is easier to keep the skin clean when the face is shaven, than if the beard be allowed to grow long. Such being the case, it is easy to perceive that, with such a dirty class as the orthodox Polish Jews, shaving is really a prophylaxis, for, as they neither shave nor keep themselves clean, their skin is exposed to all the irritating substances which collect in their beard, and the continued irritation therefrom is quite sufficient to render the skin irritable, or produce an eczema, and finally sycosis. That daily shaving is necessary in the treatment is for the majority of cases not correct, though, if it is necessary, that is no proof that it is also a prophylaxis. It is only a prophylaxis, as I have said, in the case of uncleanly persons.

We thus see that, among the different things which lead to sycosis, as eczema, exposure to strong rays of heat, dusty substances, shaving, irritating powders, cosmetics, etc., all act in the same way, producing an irritable condition of the skin, and the stiff hairs acting upon this irritable skin produce an inflammation in their immediate neighborhood, i. e., there arises a peri-folliculitis pilorum. Therefore, sycosis barbæ is not a folliculitis or an independent extension of an eczema to the peri-follicular region, but a peri-folliculitis; neither is its cause to be found in the large size of the hair, as compared with its follicle, but simply in the size and stiffness of the hairs, enabling them to act like spears on the tender skin. Sycosis, therefore, should not be classed among the diseases of the hair-follicles, but as a form of dermatitis, among the exudative affections.

Diagnosis.—There are but few diseases of the skin whose characters are more sharply defined, or that are easier to be diagnosed, than sycosis; yet it happens very frequently that other eruptions are regarded as sycosis or barbers' itch, merely because they are located on the bearded part of the face. Such an error, of course, will not be committed by those who have studied the disease carefully, and are familiar with the characteristic signs of the eruption. It is to be borne in mind that sycosis is not a frequent disease, and always pre-

sents decidedly characteristic appearances, the presence of which are necessary in any given eruption before the diagnosis sycosis can be made. On account of the rarity of the disease the chances are that an eruption, when seated on the face, is not sycosis, but some other disease of frequent occurrence in this region, as eczema or acne. Frequently sycosis is accompanied by a chronic eczema; but, if so, the two diseases can be easily separated and diagnosed by the special characters of each. In sycosis, papules, tubercles, or pustules are present, and generally all three at the same time. They are confined to the hairy parts of the body, and appear almost exclusively on the bearded part of the face; are frequently isolated, especially when the disease has become chronic, and each papule, tubercle, and pustule is perforated in the centre by a hair. When papules or pustules, wherever seated, and of whatever form, are not, or have not been, perforated in the centre by a hair, they belong to some other disease, since this perforation is an essential condition in sycosis, and is relied upon chiefly, when making the diagnosis. The diseases with which it is generally confounded are *tinea barbæ* (sycosis parasitaria of some authors), acne, eczema, impetigo, lupus, and syphilis. The use of the term *tinea sycosis*, or parasitic sycosis, for an entirely different disease from true sycosis, and the statement of some authors that all cases of the disease are parasitic in their nature, have been productive of the greatest amount of confusion among physicians and of suffering to the patients. Acting under the belief that a given eruption, because seated on the face, must be sycosis, and all cases of this disease, according to the latest views, parasitic in origin, physicians have had recourse to antiparasitides, a class of remedies which usually aggravate and prolong the disease, and subject the patient to much unnecessary suffering.

In view of the importance of the subject, I will therefore enter into full details as regards the nature of this so-called parasitic sycosis, and endeavor to show its entire dissimilarity with sycosis in every respect, and consequently the impropriety of the term sycosis for this disease, in the hope that future authors in writing upon it will treat of it under its proper designation, namely, that of *tinea barbæ*.

Gruby ("Comptes rendus des séances de l'Académie des Sciences," 1842, p. 512) first described the disease, which has been called parasitic sycosis. To the fungus found by him in this affection he gave the name *mentagraphyta*, and named the disease itself *phytomentagra*. "The fungus," he said, "is formed within the hair, and between its root and the root-sheaths, and has its origin in the matrix of the hair and in the cells composing the follicle, but is never found to rise above the surface of the epidermis. The disease is limited to the hairy part of the face, and is most frequently met with upon the chin, upper lip, and cheeks. It covers those parts with white, grayish, or yellowish scales, which are slightly raised in the middle; their borders are angular, and pierced at all points by hairs. The scales are so firmly united with the hairs that, in removing them, some of the latter are pulled out at the same time." From his whole description, and from the fact that subsequent observers have shown the identity of the fungus present in such cases with the fungus of ordinary ringworm, namely, the *trichophyton tonsurans*, it is plain that the disease described by him was not sycosis, but simply *tinea tonsurans* of the beard, a disease which is not at all rare in Paris, occurring, according to Köbner ("Über Sycosis und ihre Beziehungen zur Mycosis tonsurans," Virchow's *Archiv*, 1861, xxii. Bd., p. 46), more frequently than sycosis. Although Gruby and several other writers since his time (Nelligan, *l. c.*, Küchenmeister, *l. c.*) believed every case of sycosis to be of parasitic origin, the majority of observers hold to the non-parasitic nature of the disease, and separate it from the sycosis of Gruby, retaining, however, the name of sycosis for both diseases. In reality, the two diseases are entirely different in every essential point. The sycosis of Gruby is always parasitic in nature, and the fungus which produces the disease corresponds to that which produces ordinary ringworm—the *trichophyton tonsurans*. I consider the disease simply a *tinea tonsurans*, modified by the anatomical characters of its seat, and will in future, in speaking of this disease, make use of the term *tinea barbæ*, as being the correct designation for it, representing, as it does, the true nature of the disease. The fungus in this disease passes down into the hair-follicle, then into

the shaft of the hair, and is found in the matrix and between the hair and its sheaths. It is easily detected with the microscope in recently-altered hairs, but is frequently absent in hairs much changed or bathed in pus, as this latter is an antiparasiticide. The disease is generally preceded by a red, itching, or scaly spot of *tinea circinata*, of circumscribed or zigzag shape, upon which vesicles, tubercles, and pustules arise, accompanied with desquamation of skin and change in the character of the affected hairs. The tubercles of *tinea barbæ* arise without that pricking, burning sensation which occurs in sycosis, and are produced continuously, and not periodically, as in the latter disease. The fungus not only interferes with the normal growth of the hair, but, acting as a foreign body, produces irritation, and, secondarily, peri-follicular inflammation around the affected follicles. The hairs are affected early in the disease, becoming opaque, brittle, loose, and are easily extracted. The affected part is much indurated, and the tubercles are more voluminous than in sycosis, sometimes reaching the size of a cherry. In the majority of the cases I have seen, the tubercles were large, prominent, and studded with numerous hairs, which lay loosely in the indurated mass. The disease begins imperceptibly, proceeds slowly and steadily, always increasing in extent; while sycosis begins with severe local symptoms, pain and swelling of the part, which soon subside, but reappear in a few days, accompanied by a new outbreak of the eruption. In sycosis, the periodically recurring attacks keep up the disease, but in *tinea barbæ* the fungus, being always present, and the irritation therefore constant, the progress of the disease is gradual and continuous. In sycosis, during the papular stage, the hairs are not affected, and at that period of the pustular stage when the hair is surrounded with pus and its connection with the follicle-sheaths destroyed by the inflammation, they lie loosely in the follicle, so that epilation is easy and painless. In *tinea barbæ* the tubercles are frequently isolated, and situated on different parts of the face or neck. When several tubercles are situated closely together, they form a circular mass, or are arranged in the form of a circle, or part of a circle; they are more voluminous; their margins are sharply limited; the surface is uneven, fissured,

and studded with loose hairs ; the base is broad, firm, lies deep in the subcutaneous tissue, and generally cannot be raised without the corium. There is often a foul-smelling, sero-purulent secretion collected on its surface, which dries into a thick scab, which, when removed, takes the hairs along with it. In chronic sycosis the pustules are generally isolated, but in acute attacks they are seated more closely together. In nearly every case of *tinea barbæ*, patches of ringworm are present on other parts of the body, and even, if not present, there is often a history of ringworm among the patient's companions ; or the disease has been conveyed from some animal, as a horse or mule, with which he came in contact. The number of cases in which there is no history of ringworm is only about 5 per cent. of all cases of this disease, and it is reasonable to suppose that this percentage would be still further reduced if the previous history could be accurately ascertained. It is somewhat singular that in the only typical case of this affection which has come under Hebra's observation ("Lehrbuch der Hautkrankheiten," ii. Bd., 3. Lieferung, Stuttgart, 1876, p. 654) no history of ringworm could be obtained. *Tinea barbæ* does not disappear spontaneously, but, when cured, there is no return of the disease, unless the patient is exposed again to contagion. If all those characteristic signs are insufficient to enable the physician to make the diagnosis, though it is improbable, then a microscopical examination of the hairs will, in competent hands, decide the question. It requires, however, more experience in the use of the microscope than is generally supposed to be necessary, in order to enable the physician to decide correctly as to the presence or absence of fungi in hair or scales. Therefore, unless the physician is accustomed to the use of the microscope, it is better not to rely too much upon his interpretation of what he sees through that instrument, for he will very probably imagine to see fungi even if none are present.

Thus, the situation, form of the patch, character of the tubercles, mode of origin, cause, difference of anatomical parts primarily affected, nature of the disease, condition of the hair, and derivation of the disease from some person or animal affected with the fungus *trichophyton tonsurans*, ren-

der the diagnosis easy, and show the complete dissimilarity of this disease in every respect to sycosis.

Now, since the term sycosis was used to denote a special disease long before Gruby made his observations, no other disease, therefore, should be called a sycosis, unless it can be shown that there is a close relationship with the disease originally named sycosis, or that the disease thus primarily designated was misnamed. As regards sycosis, it is true that the term was ill-chosen, as it is exceedingly rare to find the eruption presenting any fig-like appearance. This appearance is more common in *tinea barbæ*, yet it was not on this account that this disease received its name, but from its supposed identity of seat and nature of the inflammatory changes with those of sycosis, that it received the name sycosis with the addition of the adjective "parasitic" to designate the kind of sycosis. The reason for calling *tinea barbæ* parasitic sycosis was, that it was looked upon as a folliculitis produced by a fungus, and, as the general view of the nature of sycosis was, that it is an inflammation of the hair-follicles, therefore the two diseases were considered to be similar in character and to differ only in their causation. If the view that both diseases are similar in nature and differ only in the agent producing them was correct, then there would be some reason for the use of the term parasitic sycosis. For instance, eczema is sometimes a local disease produced by some known irritant—as, for example, in eczema of the upper lip, arising from the irritation produced by a nasal discharge; at other times the cause may be entirely different, yet, from the similarity of the pathological process in both cases, the disease receives but one name, which is intended to designate the eruption and not its cause. But, even assuming the view held by most authors of the present day to be correct, namely, that in both diseases an inflammation of the follicles always exists, that fact alone would not be sufficient ground for giving the two diseases a similar name, unless this inflammation is the essential feature of the disease and of constant occurrence. In sycosis the follicular inflammation is supposed by some authors (Fox, Hebra) to be idiopathic or primary, and by others (Wertheim) as produced by the hair-sheaths, hence secondary. In *tinea bar-*

bæ the inflammation is always secondary to the nutrition changes in the hair and its sheaths, and arises from the irritation produced by the fungus present. We therefore see that only in secondary phenomena was this disease supposed to agree with sycosis, but we can never on such correspondence alone classify diseases so different in nature under one name. There is no more propriety in calling *tinea barbæ* parasitic sycosis, even if a follicular inflammation is generally present in it as well as in sycosis, and this inflammation the principal clinical symptom, than in calling scabies an eczema because an eczematous eruption is almost always present in the former disease, from the irritation arising through the presence of the *acarus scabiei*.¹ The only justification for the term would be, if, as Gruby and Küchenmeister believed, all cases of sycosis are parasitic in nature. This incorrect view, however, is not held by any living authority, since all writers accept the existence of a non-parasitic sycosis.

I have thus endeavored to make clear that, even if the view prevalent at present that sycosis is essentially an inflammation of the hair-follicles was correct, the term parasitic sycosis should not be used to designate a parasitic affection in which the changes in the hair and the peri-follicular inflammation were secondary results, and not the essential feature of the disease. But, as my observations have shown that sycosis itself is not a folliculitis, and that all changes which take place in the hair and its follicle are secondary to the inflammation around the follicle, every particle of supposed similarity between the two diseases disappears, and we must conclude that the two affections are absolutely different.

Therefore, the nature, mode of origin, course, termination, parts of skin affected, and, what necessarily follows from such great difference, the modes of treatment are all different; and, since the use of the term parasitic sycosis has also been the cause of great confusion and of erroneous ideas concerning the appropriate treatment, I ask, not only from a scientific

¹ I am quite aware that Hebra places scabies in the same class as eczema, but outside of Germany he has no followers in this classification, and it is inconsistent with the classification he gives to the other animal parasites. Neumann also opposes this classification of Hebra.

but also from a practical standpoint, that the two diseases be no longer designated by the same name, and that, if the term sycosis be retained for the peri-folliculitis pilorum, that of parasitic sycosis be no longer employed, but that the parasitic disease of the beard be classed under its proper head as *tinea barbæ*.

Acne, which is a rare complication of sycosis, is a disease of the sebaceous glands, and consequently is not confined to the bearded part of the face, but appears on the forehead, nose, shoulders, and other parts of the body supplied with those structures. It is met with generally in young persons, does not often appear in periodical crops, and the papules or pustules are not perforated by a hair. This is sufficient for the diagnosis.

Syphilis is known by its concomitants, the arrangement of its papules in the form of a circle or part of a circle, their dark copper color, slow development, the absence of pain, history of the case, and the presence of syphilitic eruptions on other parts of the body. Syphilitic eruptions rarely occur exclusively on the hairy part of the face; the papules are flatter, have a shining look, and are not preceded by the burning, painful feeling which announces sycosis. In a pustular syphilide, the loss of substance, the destruction of the corium, the kidney or circular-shaped ulcers with dirty base, the history of the eruption, its presence on the other parts of the body, and the absence of pustules penetrated by a hair, will exclude sycosis.

Eczema is probably more frequently confounded with sycosis than any other disease. The localization of the eczema, and the statement of patients that they caught the disease by having been shaved with a barber's razor, are the deceptive motives for the incorrect diagnosis. In reality, eczema, as already stated, is a very frequent precursor and producer of sycosis, and the two diseases are often present at the same time and in the same region. In eczema there is either a moist red surface and absence of epidermis, with itching and "discharge" which forms thin scabs, or there is only hyperæmia, with a harsh dry skin and furfuraceous desquamation. The eruption is not limited to the hair-follicles, or to the parts

provided with hair, but is also generally present on other parts of the face. If papules or pustules are present, they are not perforated by hairs. In impetiginous eczema, the duration of the disease, its localization, the great amount of crusting, the flat pustules, rapid march, the non-ulcerated surface under the crusts, and the absence of tubercles or papules pierced by a hair, show that the disease is not sycosis.

Lupus vulgaris occurs in young persons of both sexes, runs a very chronic course, causes but little pain, the tubercles are soft, covered with slightly-adherent scales, and are not perforated by a hair. It occurs generally either upon the nose or in its immediate neighborhood, and produces more or less destruction of the skin, which is replaced by cicatricial tissue. Lupus erythematosus resembles very closely in its chronic course and results those severe cases of sycosis which produce destruction of the gland-structures and skin-tissue. The progress of the destruction in lupus is more gradual; the margins more sharply defined; it occurs in both sexes, and generally commences on the parts of the face free of hair. There are no papules or tubercles pierced by hairs in this disease.

Prognosis.—The duration of untreated cases of sycosis varies very much in different persons, and in the different attacks in the same person: sometimes a spontaneous cure takes place in a few weeks, while in other cases the disease may continue, with greater or less severity, months, or even years. There is often a diminution in the severity of the disease during summer, and a return to its former condition in winter. Permanent, general, or partial alopecia occasionally follows untreated chronic cases, as a consequence of destruction of hair-follicles from the inflammation. In the most severe cases there may be complete destruction of the cutaneous tissue, hair-follicles, sebaceous and sweat glands, followed by cicatrices as extensive as are met with in some cases of lupus erythematosus. The tubercular form is more obstinate than the papular (Wilson, *l. c.*). In syphilitic and strumous subjects it is very obstinate (Fox, *l. c.*). The greater the amount of pustulation, the greater is the liability of the follicles being permanently destroyed. Sycosis, however, can

always be cured, and generally within a few weeks, when it is subjected to appropriate treatment; although, after complete removal, it is very liable to return within a few weeks or months, especially in autumn, and generally in the location previously affected. Therefore, while we are justified in assuring the patient that the eruption can with certainty be removed, and probably within a very short period, yet a permanent cure cannot be guaranteed, as the disease is so liable to relapse. Frequently, however, no relapse occurs, provided the patient avoids the exciting causes which favor its production. If the principal cause lies in the occupation of the affected individual, a relapse is certain to occur, unless he changes his employment. From the long-continued pus-production, or from too irritating applications to the affected surface, erysipelas may arise and prove a serious complication. This, however, is a rare occurrence, and usually the only detriment resulting from even a long-continued sycosis is the destruction of a greater or less number of hair-follicles and sebaceous glands, and consequent permanent general or partial alopecia.

Treatment.—Though sycosis can be regarded a local disease, having its origin in purely local conditions of the part affected, yet certain conditions of the general system predispose to its development, aggravate the disease when present, and prolong its duration. Those conditions must be taken into account, and receive the necessary treatment if the disease is to be treated with reference to rapid cure and prevention of a relapse. Sycosis is in this respect similar to many other skin-diseases which, although local in origin and capable of being cured by local applications alone, yet yield much more readily to combined local and general treatment, and the relapses are less frequent than when local treatment only is employed. The general nutrition of the patient must not be neglected, and any morbid condition, as rheumatism, dyspepsia, syphilis, struma, demands its appropriate treatment. Some one of those conditions is generally present, and the condition of the general system, and of every organ of the body, should be known before commencing treatment. A strumous condition of the system especially aggravates the dis-

ease, and causes an unusual amount of pus to be produced. It is unnecessary to enter into full particulars as to the proper treatment of any of those constitutional diseases, as that belongs to the domain of general medicine, and every physician who undertakes to treat skin-diseases should have a proper knowledge of internal diseases and their therapeutics. If there is a rheumatic condition of system present, alkalies are necessary; if the patient is anæmic, give iron, tonics, and a generous diet; for syphilis, mercury in some form, or iodide of potassium if gummata are present; and if strumous, cod-liver oil, and so on. Eczema, or superficial dermatitis, if present in the same locality, must be treated simultaneously with the sycosis, as the latter cannot be cured without the removal of the former. A knowledge of the proper treatment of eczema in its different phases is of much assistance to the physician in the treatment of sycosis, as there is a great similarity between the two diseases as regards the course of treatment to be followed. In sycosis of the upper lip it is especially to be borne in mind that the disease is generally kept up by a coryza, and that it is almost impossible to cure the former so long as the discharge from the latter continues to irritate the part. Much can be accomplished in the way of prophylaxis in warding off a relapse of the disease by a knowledge of the special predisposing cause at work in each case. If the patient's occupation plays an important part in producing the eruption, it should be changed, if possible. Exposure to excessive heat or cold should be avoided, also the use of cosmetics, snuff, and other irritating substances. Cleanliness is an excellent prophylaxis in this affection. When the disease is present, our chief reliance for its removal consists in local treatment, though constitutional treatment is of decided advantage as an adjuvant. The latter alone is never sufficient to effect a cure of the disease; but local treatment, used according to the special indications of each case, is adequate to effect a cure unaided by constitutional treatment, though relapses are more liable to occur. In the acute stage we should endeavor to allay irritation, and wait until the swelling and pain subside before using active measures. Lead and opium, warm applications, as a sponge dipped in hot water, or poult-

tices, should be applied. The treatment in this acute stage is simply that which is applicable, and is everywhere employed, in inflammation, when we wish to allay irritation. Until the acute symptoms subside, this soothing treatment is to be continued. After they subside we must still continue to allay irritation, for, as I have shown, an irritable condition of the skin is the principal predisposing cause of the eruption.

In the chronic stage the treatment varies, exactly as in the case of chronic dermatitis, according to the condition of the part affected. To reduce irritation, produce absorption of effused products, and remove the existing inflammation, should be the object in view. If scabs are present, they must be removed with poultices, ointments, or oily applications, before commencing other treatment. If the scabs are not removed it is useless to make local applications, as they do not reach the part you wish to influence with them. If the patient has a long beard, and will not permit its being removed, the sycosis will be much more difficult to cure than if the beard is short. Its presence, however, is not an insuperable object to successful treatment, though it retards the cure on account of the difficulty of applying remedies to the seat of the eruption. If there is any inflammatory thickening, absorbent remedies are required. Those, however, which irritate, as iodine, must not be used, as they aggravate the disease by increasing the irritation in the part. Some preparation of mercury, sufficiently diluted to prevent it from producing too much irritation, is the most suitable remedy. If the thickening is considerable, and of long standing, the oleate of mercury with morphia acts very efficiently. Care must be taken, however, not to use a very strong solution, or to apply it oftener than once every three or four days, as it sometimes irritates, and, from the facility with which it is absorbed, may produce ptyalism. Such accidents have occurred in my practice after very few applications of the oleate.

Epilation, first recommended by Plumbe (*l. c.*), is not only exceedingly useful in reducing the inflammation, but is absolutely necessary in the treatment, if permanent alopecia is to be avoided. Some authors say they derive but little benefit from it, but I believe, if it is performed at the proper time,

the result is most beneficial. To remove the hairs during the papular stage, while they are still firmly seated in the follicle, increases temporarily the irritation, as their extraction causes great pain; but during the pustular stage they are easily extracted, and when the operation is performed not only has the pus a free exit but the follicle is thereby frequently saved and permanent alopecia prevented. Though extraction during the papular stage causes pain and temporarily increases the irritation, yet I believe the evil resulting from the additional irritation thus produced is more than counterbalanced by the good resulting from the free exit allowed to the pent-up pus and the removal of the irritating hairs. Fomenting the part with hot water lessens the pain produced by the operation of extraction. In performing the operation, but a single hair should be seized with the forceps at one time, and traction should be made in the direction of the axis of the hair. Every hair perforating a papule or pustule should be extracted. In cases of circumscribed syccosis—that is, where the disease remains confined to a small spot for a long period—it is better to remove all the hairs from such a spot, even if the operation causes considerable pain. This removal of the hairs, to save the follicle and allow exit to the pus, is, I believe, a much better procedure than opening the pustules, or rather small abscesses, with a knife.

In using ointments, the same rules are to be observed as in other skin-diseases. They should always be spread on cloth and bound on the part, as they then act more powerfully and efficiently than when simply rubbed in. The diachylon ointment of Hebra is most frequently employed, and is of great service in curing the disease. The ointment should be applied twice in every twenty-four hours, and kept constantly on the part.

Whether the part affected should be shaved or not is a disputed question. Good authorities are found to differ on this question, some recommending and others opposing the operation. Basing my views upon the nature of the disease, and knowing that shaving irritates the inflamed part, I believe it is injurious, and that it is much better to cut the hairs close to the skin with scissors. If they are thus closely cut,

the part is not irritated by the operation ; ointments can be properly applied and the hairs easily extracted. Hebra (*l. c.*), who says he has tried the different methods of treatment, is decidedly in favor of daily shaving and washing the part ; yet, as equally good authority is found opposing it, future experience must decide which is the proper course to pursue.

The plan pursued at Cannstadt (" Ueber die Behandlung der Sycosis in der Heilanstalt zu Cannstadt," *Blätter f. Heilwissenschaft*, Jahr. 4, Nr. 11, 1873), of rubbing in a salve composed of two parts of ship-tar and one part of green soap until the hairs are easily extracted, then touching the cavity with acetic acid, is unnecessarily severe, and cannot be indicated in any, except perhaps chronic cases, with considerable induration and thickening of the cutis.

Ointments containing sublimed sulphur, or the iodide of sulphur, in varying proportions, according to the amount of induration and irritability of the skin, are of service, but must not be made so strong as to produce irritation.

In strumous subjects, the local application of cod-liver oil often acts more beneficially than ointments of either lead, sulphur, or mercury.

Hence epilation, and the application of astringent ointments, as the diachylon ointment of Hebra, with or without the addition of a mercurial preparation, according to the amount of induration present, and appropriate constitutional treatment, will enable the physician to cure all cases of sycosis, except the destructive form, within a few weeks, providing the patient does not continue to expose himself to the predisposing cause of the disease.

I will not enter further into the treatment appropriate for the disease in its different stages and conditions, as that would occupy too much space, and it can be learned in any good work on diseases of the skin. Epilation and the treatment appropriate for eczema can be considered the proper treatment for sycosis. We have learned that the skin is in an irritable or inflamed condition previous to appearance of the sycosis, and that the irritation from the hairs acting upon this changed tissue produces the peri-folliculitis. This irritability must be removed, as well as any actual inflammation or

inflammatory products in the affected part. The same rules for treatment hold good here as in inflammation or irritability in any other part of the body, and the physician must know those rules and have a clear idea of the exact nature of the process going on in the part in the different stages and conditions of the disease. Knowing those things, he cannot fail to cure quickly every case of ordinary sycosis.

Explanation of the drawings :

All the drawings have been made by myself by means of a camera-lucida, and are exact reproductions of the appearances presented. Owing to severe illness and limited time, I have been unable to make as many drawings of the changes which take place in the pustular stage as I intended to do. I studied the sections, however, carefully, and have endeavored to describe the changes.

ART. II.—*The Clinical Use of the Sphygmograph.*¹ By ALFRED L. CARROLL, M. D., President of the Society.

THE importance of instrumental aids in physical diagnosis consists in their giving us a registrable measurement of the degree of departure from a known standard of healthy action. Without them the information gained by the best-educated senses is to a great extent guesswork. We can easily, by touch alone, ascertain that a patient has a "high fever," or is "a little feverish," but the thermometer only can tell us the amount and portent of the pyrexia. So, with regard to signs derived from the circulatory apparatus, the practised finger can detect the marked peculiarities of a pulse that is "hard," or "soft," or "quick," or "wiry," or "irregular;" but as to the quantitative estimation of these and other deviations it teaches little. Here the sphygmograph comes to our assistance, giving its visible delineation of the phenomena which we partly know, and showing us others which we could not discover in its absence; just as the thermometer indicates minor alterations of temperature inappreciable by the unaided senses.

¹ Read before the Richmond County Medical Society, July 11, 1877.

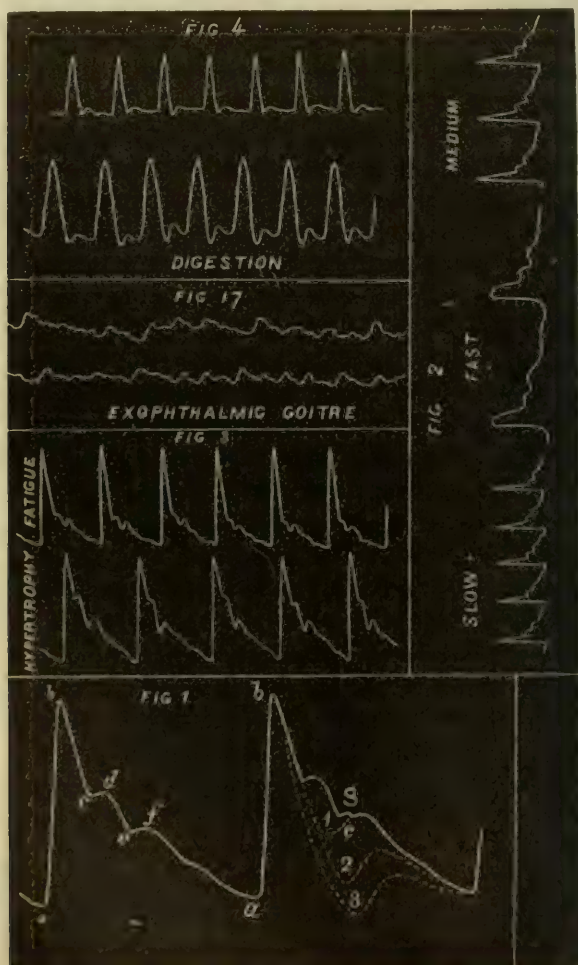
To find the true clinical place of the sphygmograph, we must guard against an over-estimate of its pretensions, bearing in mind that, like other instruments of medical inquiry, it is but an aid, not an all-sufficient means of diagnosis; that it records rather the extent than the precise nature of a morbid process. But, with this limitation, its tracings, taken in connection with other sources of information, will often prove of the highest value, and sometimes afford the earliest indications of disease which we should otherwise have overlooked.

It is, of course, first necessary to know the character and significance of the typical pulse-tracing of health, and the modifications of this under physiological conditions. The curves of the tracing, it must be remembered, represent simply the perpendicular rise and fall of the wall of the artery to which the instrument is applied, as it is distended by the waves of the blood-current. These curves, therefore, teach us directly of the tension and elasticity of the artery, and indirectly of the force with which the blood is propelled into it. A disturbing agency may be central, as in the case of cardiac lesions; or distal, as when the arterioles are contracted; or intermediate, as an aneurism.

The sphygmograph may be applied to any artery which comes near enough to the surface for its pulsations to be felt, and in some instances, where it is desired to locate a thoracic or abdominal aneurism, we may try different situations; but, for ordinary purposes, the most convenient place is the familiar fossa between the styloid process of the radius and the tendon of the flexor carpi radialis, where a little practice will enable us to procure the fullest possible development of the curves in any given case. Since Marey's original mechanism, and its modifications by Sanderson and Anstie, several different forms of sphygmograph have been devised, among which Mahomed's, in England, and Holden's, in America, are well known. Besides these, there have been some others which I have had no opportunity of testing, all, however, with the exception, I believe, of one inchoate invention a few years ago, depending for their graphic power upon a spring-pad pressing on the artery. By far the most sensitive and satisfactory instrument which I have seen is one constructed by Dr. E. A. Pond, of

Rutland, Vermont, in which the arterial waves are transmitted through a film of India-rubber to a column of water bearing a float, the rise and fall of which move a lightly-balanced lever terminating in a flail-jointed needle, whose point, resting on a smoked slip of mica, records the pulse-tracing. By this means resistance and friction are reduced to a minimum.

The subjoined enlarged tracing of a healthy pulse (Fig. 1) shows the main points to be kept in view :

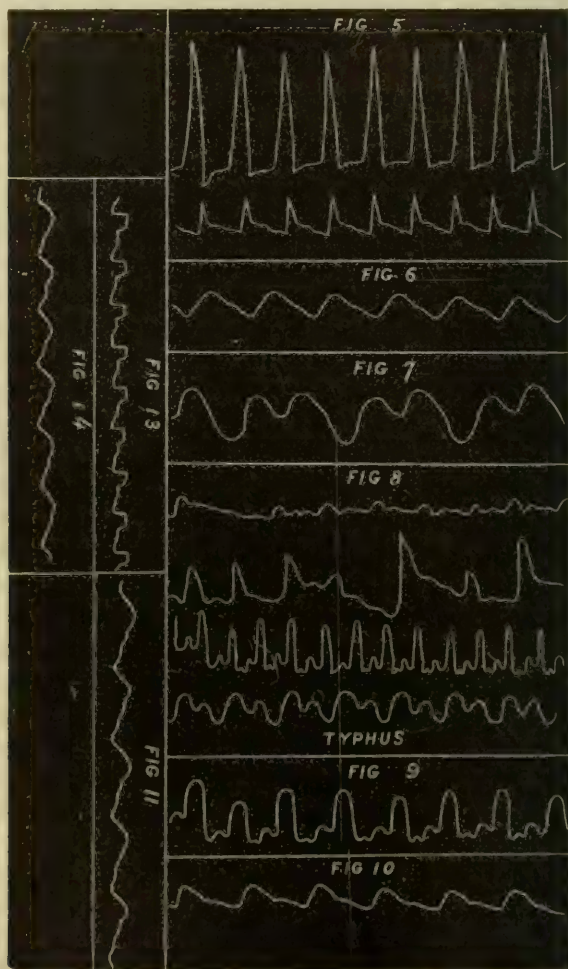


From *a* to *b* is the quick rise of the artery, caused by the first wave from the contraction of the ventricle, *b* being the point of greatest distention of the artery; from *b* to *c* is the recontraction of the elastic arterial wall, vibrating for an instant so as to overcome the impetus of the current; from *c* to *d* is a secondary redistention of the vessel by the wave following this momentary check; from *d* to *e* is the continued contraction of the artery down to the closure of the aortic valves, at *e*, the shock of which is followed by a fresh rebound of the blood-column at *f*. From *a* to *e*, therefore, we have the phenomena of the heart's systole; from *e* to *a* again, those of the diastole; or, as regards the vessel under observation, from *a* to *b* is the sudden afflux of blood into the artery; from *b* to the end of the tracing is the gradual efflux of blood from it. Where the artery is elastic and the tension low, several subordinate waves are often shown in the diastolic line from *e* to *a*, and occasionally an interpolated wave (*g*) is seen at the aortic closure where there is no evidence of valvular disorder. In many pathological, and in some physiological, conditions, we find what is known as "dicrotism," characterized by obliteration of the first secondary wave and deepening of the "aortic notch;" the dotted lines 1, 2, 3, indicate respectively "subdicrotism," "full dicrotism," and "hyperdicrotism," the aortic notch in the latter falling below the general base-line of the tracing. Knowing the significance of these different parts of the normal pulse-trace, we are better prepared to appreciate the import of any deviations from them.

It is to be remembered, in the first place, that the rate of speed at which the record-bearing slip is moved will considerably modify the form of the curves. This is shown in Fig. 2, where the same pulse is traced with the slip moving at "slow," "fast," and "medium" rate.

The amplitude of the tracing, or the height of the line of ascent, is influenced by the amount of pressure brought to bear upon the artery. The pressure requisite to develop the amplest trace in any given instance should be noted as indicating the resistance of the pulse. The average pressure to be used is stated by Weiss to be 300 grammes (10.6 oz. av.); Sanderson estimates it for the most resistant pulses at 400

grammes (14.1 oz.). The latter author was, I believe, the first to formulate the clinical indications afforded by this means, pointing out that in fever, if low pressure suffice to bring out the maximum trace, stimulants will be useful ; while, if as much as 200 grammes (7.05 oz.) be required, stimulation is needless.



On the scale of Pond's instrument each division represents fifteen grammes, or a little more than half an ounce (thirty indicating a pound) ; but, as the elasticity of the wrist-clasp has

also to be overcome, the apparent pressure must be increased by some ounces in most cases. Aside from the pressure, however, the height of the "systolic apex" (which, as we have seen, is the point of equilibrium between cardiac impulse and arterial distensibility) is affected by two opposite sets of causes. Thus, it may be increased either by augmented force of the ventricular contraction, as in hypertrophy, or by diminished tonicity of the arterial walls, as in advancing age (without senile degeneration), or simple fatigue. The similarity and the distinction between these conditions are illustrated in Fig. 3, the upper tracing being that of fatigue in a healthy man, the lower, that of uncomplicated hypertrophy.

The pulse of fatigue, it will be noticed, is marked by a high systolic ascent and an abrupt fall, the first wave of rebound being close to the aortic notch, and the tracing generally showing "low tension." In the pulse of hypertrophy, the line of descent shows no signs of diminished arterial resistance, but only an increased *vis a tergo*, the preaortic wave being high up, and the whole character of the tracing an exaggeration of that of health.

The position of the preaortic wave is determined, on the one hand, by the ventricular force; on the other, by the fullness of the artery. In the typical tracing of robust health, it is situated at about the junction of the upper and middle thirds of the line of descent. In proportion as the cardiac impetus is enfeebled (producing a shorter line of ascent), or the tension of the artery increased, this wave will approach nearer the systolic apex; while an increase of the systolic ascent, or a lessening of the volume of blood in the vessel, will cause a relative or an actual lowering of the wave, or even its total obliteration. This is commonly seen after a hearty meal, when, a greater amount of blood being attracted to the digestive organs, the peripheral vessels are partially emptied, giving a "dicrotic" tracing (i. e., an unbroken descent to the aortic notch) with very low tension. Fig. 4 shows the radial pulse of digestion, the upper tracing being from the same subject as in Fig. 2, the lower from a vigorous and athletic man; in both, and especially in the latter, the fall of the aortic notch is hyperdicrotic.

We have learned, thus far, that the characters of a healthy pulse-trace may vary in rest or fatigue, before or after a meal; and these circumstances are to be considered in the examination of any individual case. As a rule, the highest rise and deepest fall will be found in the after-dinner pulse of an elderly person of sedentary habits, while the most compact and gradual-descended tracing belongs to vigorous, fasting youth. Fig. 5 is a tracing taken from a gentleman past seventy, with slight functional irregularity, but no actual lesion of heart or vessels. Below it, for comparison, is the pulse-trace, during digestion, of an active, healthy boy of eleven.

The condition of dirotism is also induced by heat, emotion, or alcohol taken to the commencement of narcotism; and it affords a measure of the severity of febrile action, subdirotism accompanying mild pyrexia, and hyperdirotism warranting a grave prognosis, and pointing to the need of stimulants, which, in such case, manifest their beneficial action by raising the aortic notch to a higher level.

Among the pathological indications given by the sphygmograph, one of the most important is the amount of tension, which is shown chiefly by the character of the line of descent. The greater the tension of the artery, the more does this line of descent approach a convex form, and the less marked are its "notches," especially the preaortic one. The amplitude of the tracing is less, even though the impulse of the heart be stronger, because the obstruction to the efflux of blood from the artery prevents it from falling to as low a base-line as when the vessel can empty itself freely. When the tension is very great, the line of ascent will have a decided slant—the diagonal of the "parallelogram of forces"—owing to the slowness with which the already replete artery yields to the incoming wave. Fig. 6 shows a tracing of this sort, somewhat enlarged.

High tension is indicative of a distal impediment to the egress of blood from the artery, and for its cause we must look to the capillary circulation in most cases. Whether from the "hyaline-fibroid" thickening described by Gull and Sutton, or from the muscular hypertrophy of the arterioles demonstrated by George Johnson, or from spasmodic contraction of

these latter, we shall have increased fullness of the arterial trunks, either permanent or temporary. Thus, tension is for the time heightened in angina pectoris, spasmodic asthma, probably in the initial stage of epilepsy; in blood-poisonings of various kinds, whether in the zymotic exanthemata, lithæmia, alcoholism, or plumbism; while in renal disease Dr. Mahomed has pointed out the early diagnostic value of augmented tension during what he terms the "prealbuminuric" stage, the transudation of albumen being, according to his view, the result of a farther and extreme tension of the capillaries.

As regards valvular cardiac lesions, the brief time at our disposal will force me to deal with them cursorily; and, indeed, much yet remains to be done before the sphygmograph can add greatly in this direction to the knowledge which we may derive from the stethoscope; its tracings showing us, as I have already remarked, rather the extent than the precise nature of the disorder.

In mitral regurgitation, the insufficient force of the heart's systole fails to distend the artery promptly and fully, and, accordingly, we have a feeble and more or less slanting ascent with a blunted summit instead of the sharp apex of health, deficiency or absence of the preaortic notch; and the general character of the tracing indicates that the contractile power of the artery is more than a match for the distensile action of the heart. There is, however, no uniformity in the tracings produced by this condition, and very similar curves may arise simply from functional weakness of the heart's contraction, notably, as Sanderson has shown, in the undulating pulse of typhus. Hyperdirotism is usually present. Diagrammatically, the tracing of mitral regurgitation is represented, enlarged, in Fig. 7.

But practically there are many departures from this type, depending on the amount of ventricular hypertrophy, the resistance of the arterial walls, etc. Fig. 8 shows some of these variations, the upper tracing being copied from Da Costa; the second, from Sanderson, evidently accompanied by hypertrophy; the third is from a case of rheumatic endocarditis, which I had the opportunity of examining with Dr. C. H.

King, wherein, with a marked systolic murmur at the apex, there were much debility and extremely low tension; below this, for comparison, is the pulse of typhus, taken from Sanderson.

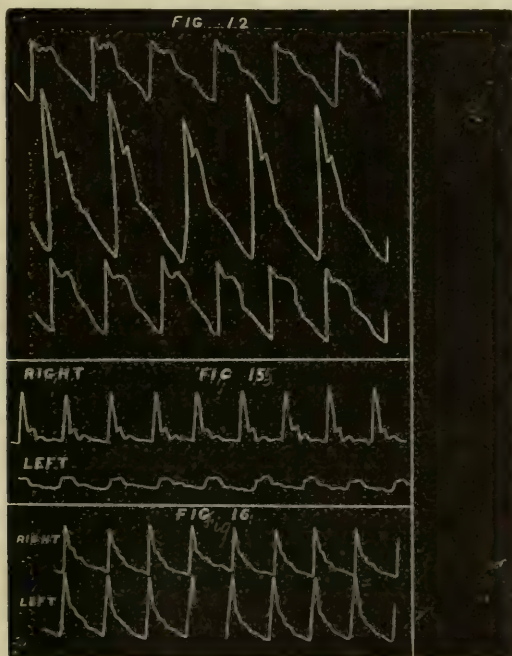
With regard to the last two examples, it will be noticed that the slip was moving in my tracing only about half as fast as in Sanderson's; an equal rate of speed would spread out the curves thus:

Mitral obstruction gives an oblique ascent with low tension, but the pulse-tracing is, as a rule, more regular than in mitral regurgitation; varying, however, in the more advanced stages of the disease, and indicative rather of diminished *vis a tergo* than of the specific lesion, which can be more accurately ascertained by means of auscultation. A sphygmogram of mitral obstruction, after Marey, is given in Fig. 10.

Still more marked is the obliquity of ascent in the case of aortic obstruction, which, by retarding the flow of blood into the arteries, causes a gradual instead of a sudden distention of their walls. The usual curve in this condition is shown in Fig. 11; but, as will be seen further on, it is not unlike the tracing of mere senile degeneration; indeed, a similar trace may be produced by any cause which weakens and prolongs the ventricular systole.

Be it remembered, that none of these tracings of valvular lesions are to be accepted as typical from a diagnostic point of view; their general characters, rather than their individual traits, are to be considered, and these only as indicating the extent to which the circulation is crippled. Modification may be produced by the force or feebleness of the heart's action, by the condition of the arteries, and other disturbing factors; or we may have a coincidence of more than one lesion, as when aortic obstruction leads secondarily through dilatation of the ventricle to mitral incompetence; mitral or aortic regurgitation induces compensating hypertrophy; or when at either orifice a double lesion—both obstructive and regurgitant—is established. In fact, the only valvular disorder which gives an almost unmistakable pulse-trace is aortic regurgitation, wherein we find, as might be expected, a marked diminution, or even a total obliteration, of the aortic notch (which, as has

been shown, is caused by the quick closure of the aortic valves), accompanied by a sudden fall from the preaortic notch, which is usually much higher up than in health. The complete emptying of the artery during diastole gives amplitude to the trace by lowering the base-line. Occasionally a vibratile movement is seen at the preaortic notch, giving a multiple wave. This is illustrated in the upper tracing of Fig. 12, copied from Foster. The second tracing is from Sanderson, showing marked aortic regurgitation with hypertrophy. The third is my own.



The comparative rarity of valvular lesions of the right side of the heart, and the fact that their effects upon the systemic arteries must be produced by a backing up through the venous circulation, deprive their sphygmographic tracings of any diagnostic importance, the curves indicating chiefly variations of tension or diminished impulse of the left ventricle, as the difficulty at either right orifice may be regurgitant or ob-

structive. Tricuspid obstruction will indirectly induce heightened tension through the systemic capillaries; tricuspid insufficiency, or either form of disease at the pulmonary opening, will more or less weaken the systolic part of the pulse-trace by diminishing the quantity of blood received by the left auricle.

Atheroma manifests itself in a decapitation of the line of ascent, which, instead of the sharp apex of health, terminates in a horizontal plateau, as in Fig. 13.

Senile degeneration of the vessels, impairing their elasticity, gives a tracing somewhat resembling that of aortic obstruction, with rounded summit, high position of the preaortic wave, and shallowing of the aortic notch. This is seen in Fig. 14.

A very practical use of the sphygmograph may be made in the diagnosis of aneurism, the pulse-trace on the distal side of an aneurismal enlargement being, of course, deprived of its normal angles and notches, and reduced, if the sac be large, to a mere undulating line. Fig. 15 shows the right and left radial tracings from a case in the Seamen's Retreat Hospital, in which rational symptoms alone led Dr. King to diagnose thoracic aneurism, the physical signs not being satisfactorily marked.

Here the sphygmogram demonstrated conclusively that the aneurism was situated at the transverse arch of the aorta, on the distal side of the innominate, but involving the origin of the left subclavian. On the other hand, in a case which I saw with my friend, Dr. W. C. Walser, where there was a pulsating tumor rising above the clavicle at the inner side of the right sterno-mastoid, and all the rational signs seemed to warrant a diagnosis of innominate aneurism, the right and left radial tracings were as in Fig. 16; proving that the enlargement was confined to the trunk of the right common carotid, which was probably longer than usual, or perhaps sprung independently from the arch of the aorta, as sometimes happens. Certainly, there is no involvement of the aorta itself, nor of the right subclavian, though the somewhat less amplitude of the right tracing (taken with the same pressure) would appear to indicate a slight mechanical compression of the latter artery. In this case the heart was greatly enlarged.

Functional disturbances and irregularities, of course, impress their modifications upon the pulse-trace, but it is seldom necessary to call in the aid of the sphygmograph for their diagnosis, except, perhaps, in an obscure case where its record may serve to exclude organic lesion. As an instance of extreme irregularity, Fig. 17 shows tracings from a case of exophthalmic goitre, which I was enabled to procure through the kindness of Dr. Walser.

It would be easy to multiply examples of different morbid conditions, but my object has been to select the more salient and practically useful features of sphygmography, pointing out as briefly as possible the results which have been obtained thus far, and leaving to be inferred how much may yet be done by careful observation to increase the clinical value of one of the most ingenious of instruments.

Translations.

The Hereditary Transmission of Syphilis. By Dr. M. KASOWITZ, Attending Physician to the General Hospital for Children, Vienna. 1876. Translated for the NEW YORK MEDICAL JOURNAL by Milo A. Wilson, M. D., Clinical Assistant to Professor of Dermatology, Bellevue Hospital Medical College; late Attending Physician to New York, Northwestern, and Bellevue Dispensaries; Member of County Medical Society; Assistant Surgeon Seventh Regiment, N. G. S. N. Y., etc., etc.

(Continued from August Number.)

VI. *Theory of the Heredity of Syphilis.*—It being proved, according to the thorough investigations thus far obtained, that

The direct transmission of syphilis from the father to the child undoubtedly occurs, because in innumerable cases the health of the mother of an hereditarily syphilitic child has been subsequently proved;

As, further, transmission to the foetus from a mother

syphilitic at the time of conception is generally and indisputably accepted ;¹

As, finally, the placental infection of the fœtus has been entirely excluded :

Therefore, the theory of the heredity of syphilis appears in the highest degree simplified, and bears, from this simplicity alone, the stamp of truth. It runs as follows :

The transmission of the syphilis of the parents to the child—as a matter of course, apart from the extra-uterine inoculation of the latter—*occurs solely and alone through the act of procreation*, consequently, through inheritance in the narrowest sense, because the father, syphilitic at the time of procreation, provides a sperm-cell containing the syphilitic virus, or the constitutionally syphilitic mother furnishes at the moment of conception an ovum similarly diseased for the generation of the new individual.

Father and mother are entirely equal in relation to the power and the process of the inheritance of syphilis. Syphilis inherited from the father differs in no way from that inherited from the mother. The assertion of Baerensprung that the hereditary syphilitic affection of the liver only takes place in heredity from the father, the hereditary syphilitic disease of the lungs, on the contrary, exclusively from the mother, has proved itself to be entirely unfounded and untenable.

The presence of general syphilis at the time of procreation in one of the parents alone is sufficient for the transmission of the same to the child. As a matter of course, also, a child, both of whose parents suffer from general syphilis at the time of procreation, inherits the disease. Whether, in such a case, the poisoning which is transmitted from both cells of procreation is concentrated in the new individual, is a point which in a single case is neither to be asserted nor denied. At all events, as we shall prove later statistically, the liability of a more intense poisoning of the product of such a conception is, owing to this combination, increased.

The inoculation of the mother with general syphilis, after conception has occurred, has no influence upon the transmis-

¹ The question of the sterility of constitutionally syphilitic women will be discussed further on.

sion of the disease. If the father is healthy at the time of conception, the product, consequently, of two non-syphilitic cells of procreation, cannot afterward become diseased *intra uterum*, and it is born healthy. If the father is syphilitic at the time of conception, the paternal disease is transmitted to the fœtus; the syphilis of the mother, however, contracted subsequently, has no connection with the syphilitic affection of the fœtus.

The syphilis of the mother is only in so far more injurious to the progeny than that of the father for the reason that, apart from the power of transmission of syphilis equally invested in both parents, the probability also exists that the disease of the mother may cause an interruption of the pregnancy, and—independently of the syphilitic poisoning of the fœtus—the life of the latter may in this manner be endangered. We shall be placed in a position to strengthen this assertion also through statistical evidence.

Finally, the opinion that a syphilitic mother may affect the fœtus—be it syphilitic or not—in such an unfavorable manner that, in consequence of her own disease, she furnishes during pregnancy more unsuitable nourishment than if she were healthy, deserves certainly to be taken into consideration; to which, however, it must be said distinctly that this could have nothing whatever to do with the inheritance or transmission of syphilis.

Before we now proceed to follow up singly the practical results of the points thus far obtained, we will endeavor, in connection with them, to acquire a deeper insight into *the nature of the syphilitic virus*.

Here we have at once presented an acknowledgment, upon the ground of experience obtained through observation founded upon facts, that the syphilitic virus is neither transmitted from the mother with acquired syphilis, to the fœtus healthy from conception, nor from the fœtus diseased through the paternal sperm-cell, to the healthy mother; that, consequently, this virus does not pass through the partition-walls or septum of the maternal and fetal vascular systems in any or either direction. This non-transmission appears at first sight somewhat remarkable, as we

well know, and have in the beginning of this treatise expressly stated that other poisons, such as that of smallpox, measles, etc., passed through these walls, at least in the one direction, from the mother to the foetus. The contradiction is, however, only a seeming one. There exists, evidently, a very great difference between the contagion of syphilis, on the one side, and the contagion of the above-named exanthematous, infectious diseases. According to all our knowledge, thus far, the contagion of the latter is fugitive—that is, it is not connected with a cellular element (cellular tissue) of the organism creating the contagion, nor with a blood or a pus corpuscle, as it may even be transmitted from one individual to another by the surrounding atmosphere. We must, therefore, imagine it as suspended in the air in exceedingly minute particles, and is, evidently, also contained in the same condition in the secretions of the diseased organism. It can, therefore, be carried into the fetal circulation by the fluids emanating from the maternal vascular system, and may there occasion the corresponding disease-process. A case is even conceivable in which this disease-creating material, being brought from without into the maternal organism, is again further conveyed into the fetal circulation, occasioning a disease of the foetus alone, while the mother remains spared; because, in her organism, the conditions for the development of this disease are not still present if she, for instance, has become exempt through a previous illness.¹

In relation to the syphilitic contagion it is quite different. This is undoubtedly a fixed contagion, i. e., it is always connected with the cell-element (*Gewebelement*) of the diseased organism, and can only be transmitted to a foreign organism by this element. It is intimately associated evidently with pus-cells and blood-corpuscles, and is, therefore, not present in a fluid which contains no organized elements. At least, with a great number of such organic fluids, it is proved that they are not qualified to bring about an inoculation in a healthy organism, i. e., to transmit the virus thereto.

¹ Edward Jenner himself reports two cases in which two vaccinated mothers, being brought toward the end of pregnancy into close connection with smallpox patients, gave birth to children with pronounced smallpox without themselves becoming ill.

Accordingly, it has been often verified that the milk which contains, indeed, milk-globules (i. e., a coagulated mass of fat-globules), but no cell-elements, cannot transmit the syphilitic virus, which we also can confirm, as the result of very varied experience. The innocuousness of the serum of the blood is proved in the most striking manner by the analogous experiments of Pelizzari. By means of a charpie compress, he transferred fresh blood, obtained by venesection from a syphilitic man, into an incision upon the skin of a healthy man; and then the same blood, in a cold and clotted condition, in which the blood-corpuscles are inclosed within the coagulated fibrin, upon two healthy men, in the same manner. Inoculation resulted only in the first case; the other two remained unaffected. As further evidence, it has been proved, through direct experiment as well as through clinical experience, that clear, pure vaccine-lymph taken from a syphilitic individual is not capable of transmitting syphilis. On the contrary, inoculations with the blood of syphilitics, with gonorrhoeal, chancroidal, and bubonal pus, with the secretions of syphilization ulcers in syphilitics, therefore with fluids containing blood or pus corpuscles, have in many cases been successful.

If we now bear in mind the process of the interchange of nutritive fluids between the maternal and fetal circulations, it is apparent that even fluids and gases, as well as substances which are dissolved, or exceedingly finely divided and suspended in the same, pass from one vascular system into the other; but that there can never be a question of the passage of a blood-corpuscle from the circulation of the mother into that of the fœtus, and *vice versa*, because such a transmission is rendered impossible by the complicated nature alone of the materno-fetal septum between the two vascular systems, viz., vascular wall of the venous spaces in the decidual tufts; cylindrical epithelium of the latter; pavement epithelium of the chorion meshes; mucous membrane of the latter, in which the fetal capillaries are deeply situated; vascular wall of the capillaries. Consequently, as an interchange of blood-corpuscles is not possible, so, for the same reason, the passage of a virus, engrafted upon them, is in both directions prevented;

a result which, as we have seen, corresponds entirely with actual experience.

Another point, regarding the nature of the syphilitic virus, arises in the consideration of the gradual differences, which are of importance, relative to the hereditary transmission of this virus. In the remaining diseases, which we must assume are inherited in the same manner, viz., through the semen or ova, such a gradual difference is either entirely unprovable, as in mental diseases, epilepsy, and similar affections; or, if such gradations are really present, as in phthisis, gout, etc., they are entirely anomalous, and cannot be relied upon in any way as legitimate. We see, on the contrary, in the inheritance of syphilis in a succession of consecutive births, which owe their inherited dyscrasia to the same parental source, a constant, positive decrease, we might almost say, in reversed arithmetical progression, in the intensity of the poisoning, evidencing itself particularly in the gradually-retarded outbreaks of acute syphilitic symptoms in each child. While, for instance, the first most intensely-affected embryo succumbs during the fifth or sixth month of intra-uterine life to the outbreak of fetal syphilis, all further gradually-decreasing grades of intensity of the poisoning may, in a satisfactory number of consecutive pregnancies, appear in a regular and continual succession. The foetus may die in the seventh or eighth month; a child with pemphigus may be born in the last month, or at the end of the normal period of pregnancy, or there follows an eruption of the exanthemata during the first days of life; then, in the second, third, and fourth weeks, or in the course of the second, third, or even at the end of the third month.

These peculiar conditions allow us to regard the process of the inheritance of the syphilitic virus through the cells of procreation as one more conceivable—I might say as more commonplace—than the process of the inheritance of other physiological or pathological qualities, which are at once removed from every more searching investigation. The contagion of syphilis, whether it acts through infection or heredity, we must at all events consider as something organic in character; if not exactly as an independent organism of an animal

or vegetable nature, nevertheless, as a morbid alteration of a never so minimum portion of organic material, which, under suitable conditions, may be disseminated through the remaining mass of the same organism—be it a solitary cell, like the ovum or the sperm-cell, or a collection of cells, as in the embryo, the fœtus, and the living individual—and, being transmitted with a particle of the diseased being into a foreign organism, creates there the same successive modifications. We must, therefore, necessarily conclude that in a cell of procreation, derived from a syphilitic individual, the specific virus, i. e., the organic material, morbidly altered in a certain way, already exists as such, just as it is contained in a pus or blood corpuscle furnished by the same individual. This does not exclude the possibility that the degree (stage) of development of this organic matter in a procreative cell may be a different one, perhaps of a lower order, more recent (*jüngere*), than that of a pus-corpuscle furnished by an ulcerated primary lesion or moist papule; because, in the last case, as a rule, only eight or ten weeks—in the first, however, from six to twelve months—elapse before there appears, within the organism receiving the virus, the first development of the analogous lesions, such as syphilitic infiltration of the skin and mucous membranes, in the form of maculæ, papules, etc.

We must also, of course, not lose sight of the fact that, in the first case, we have to deal with an organism already developed, in the other, with one just developing.

While, then, in view of the conditions just evolved, it might seem proper to imagine the virus contained within the cells of propagation as *qualitatively* different from that within the blood and pus cells of an individual suffering from already-developed syphilis, we can, on the other side, only explain the varied operation of the virus in several cells of procreation, furnished consecutively by one person during a long course of time, as also the gradual decrease of the syphilitic heredity, by considering that these cells contain the specifically-altered organic material in a varied proportion, consequently only *quantitatively* different; and that the amount of virus contained within the cells of procreation is, as a rule, proportionate to the amount of virus distributed through the parental

organism, which, in recent, general syphilis, must necessarily be very large, and in an illness of long duration probably always decreases more and more. In the acceptance of a qualitative difference of the virus, in the procreative cells produced in the different stages of parental syphilis, consequently a difference in the degree of development of the virus, we would be accepting the unpardonable fallacy that a very *recent* parental syphilis, in which the virus also must necessarily be in an early stage of development, effects, notwithstanding in a very much *shorter* time, the full development of the disease in the foetus, than the virus communicated to the cell from an organism affected with chronic syphilis; and which, in spite of the fact that it (the latter) is in a more advanced stage of development, nevertheless, requires several months longer before it can effect the full development of the disease in the foetus.

As, therefore, a qualitative difference, or a difference in the developmental stages of the virus, in the single procreative cells, does not explain these conditions, we are forced to the assumption of a quantitative difference. In recent syphilis of the progenitor, there would exist, naturally, owing to the greater amount of virus accumulated within his organism, a proportionately larger number of individual diseased propagation-cells; and the *greater* amount of specifically-altered material contained within these cells would effect the complete development of the disease in the foetus in a *shorter* time than the lesser amount of virus which, owing to the long duration of the already modified (weakened) parental syphilis, and to the greatly-decreased amount of virus disseminated throughout the parental organism, could now only affect isolated, scattered cells. An analogy with the process of fermentation is here scarcely to be overlooked, inasmuch as a larger amount of the material employed to excite the fermentation, in a definite mass to be fermented, must effect this result much more quickly than a lesser amount of the same material. With this, however, the analogy, of course, ceases.

Since we have now succeeded in defining the mode of inheritance in this manner, it behooves us further, upon the one

hand, to discuss the conditions upon which the parents are enabled to transmit syphilis to their progeny, and, upon the other hand, to become more closely acquainted with the relations between the intensity of the inherited disease and the stages of that transmitted. The chapters immediately following will treat of these subjects.

VII. *Power of Transmission in the Parents.*—The first and essential condition is, as a matter of course, the existence of syphilis in the individual transmitting the disease. We must, therefore, at first, without entering more closely into the controversy regarding unity and duality, assert at this point, that only syphilis in a general form, whether proceeding from a genuine Hunterian chancre, a primary papule, or, finally, apparently from a soft chancre, possesses the capability of being transmitted to the progeny; and that, accordingly, there can, of course, never be a question of an inheritance of syphilis from an individual suffering from mere virulent blenorrhœa, or from a local chancroidal ulcer, producing at the most buboes in the adjacent lymphatic glands.

The answer to the question, *when*, after a syphilitic inoculation, *the individual inoculated has the power to transmit syphilis*, is not so simple; whether during the latency of the primary lesion, consequently between the time of infection and the development of the primary induration, or the primary papule equivalent to it, or only after the formation of the primary lesion, and before the development of the first general symptoms (universal swelling of the glands and exanthemata), or, finally, only after the appearance of the latter. This question, up to the present time, is still undecided, and, owing to the nature of the subject, will probably always remain so. Observations of such accuracy and reliability would be required as can but remarkably seldom be made. We are well entitled, however, to exclude, upon theoretical grounds, the power of transmission during the first period of incubation, therefore, before the formation of the induration, because the Hunterian chancre is not regarded now, as it was by Baerensprung, as an evidence of general disease, but as a local product of infection. The second period of incubation, between the formation of the chancre and the outbreak of the first

general appearances, will probably always remain doubtful. On the contrary, syphilis, from the moment of the eruption of the first exanthemata, is undoubtedly transmissible.

The assertion of Cullerier, that the mother can transmit syphilis to her child in every stage, including that of the simple primary lesion, is stated by this author, without any foundation whatever upon truth. Merely as a curious fact, we will here mention the opinion of Albers (1832), who held it to be possible that a syphilitic man, during coitus with a pregnant woman, might inoculate the fœtus without the mother becoming diseased. Diday, also, in his highly-extolled work (*l. c.*), regards this wonderful method of transmission as not impossible.

The opportunity here presents itself to speak of the so-called *infectio per partum* (*infection au passage*), which in its time played so important a rôle. The question is simply whether, during the time of labor, the child can become inoculated by local syphilitic affections of the maternal genitals, of either a primary or a secondary character. This question, of course, has nothing to do with the heredity of syphilis, but was formerly, particularly in the beginning of this century, deemed of great importance by the non-supporters of heredity; because, by this means of inoculation, they could explain the so-frequent undeniably-syphilitic affections of new-born children. That these writers could justly attribute an isolated case of infantile syphilis to this mode of inoculation is perhaps possible. But all positive points are wanting as to how they explained the illness of a succession of children of the same parents by the *infection au passage*. As, now, no one doubts the existence of hereditary syphilis (except Hermann, 1860, who denies the disease in general, consequently also its heredity, regarding the symptoms, held by all others as those of hereditary syphilis, to be brought about by deficient care and nursing), therefore, also, the necessity or importance of this manner of infection has disappeared, and, in fact, since the time of Thiry (1852), who was the last who mentioned it, and even gave it the unsuitable title of "hereditary chancre," it has remained unspoken of. If we should now discuss the possibility of such an inoculation, we must, first of all, state that,

notwithstanding the many hundred times it has been mentioned by writers, there is not to be found in all literature a really trustworthy report of an "*infection au passage*" having taken place. The two solitary cases spoken of by Behrend (1851) are in no way reliable, because, in the first case, the general exanthema appeared in the child as early as the tenth day; in the other case, the primary ulcer upon the second day, and afterward only an eruption, "which was very similar to a dry eczema." All remaining authors refer to their predecessors, and these again discuss only the theoretical possibility, without communicating positive observations. Further, it is well known that again and again numbers of women with syphilitic ulcers upon the genitals, and masses of suppurating condylomata in the vicinity, have given birth to children without inoculating them. In several cases, in the Vienna Lying-in Institute, I had myself the opportunity of proving this. The transmission of a simple chancroidal ulcer, which is in the highest degree inoculable, from the genitals of the mother to the child at birth, has, to my knowledge, been equally seldom observed. Consequently, as all practical experience entirely fails, it only remains to discuss theoretically the chances of such an infection, which, in principle, is not impossible. They are, at all events, in consequence of the child's body being covered with the vernix caseosa, by the mass of amniotic liquid, and by the quick passage of the larger portion of the child's body through the external genitals of the mother, remarkably slight. We may, then, with confidence drop this subject, and, if at some time such a case should really occur, it would be entirely irrelevant to the subject with which we are now concerned.

From the moment of the outbreak of general syphilis, the individual suffering from the same possesses the power to transmit the disease to his progeny by means of the cells of procreation. This power, which we will designate as *procreative syphilis*, is, therefore, one of the symptoms of constitutional syphilis, and, indeed, one of the most important. Even if it is not so easy of observation as the lesions upon the skin, the mucous membranes, etc., which come under immediate inspection, it is, nevertheless, in the highest degree, significant

for the determination of the degree and intensity of the disease, and may be even, although only for a limited period of time, the only symptom in which syphilis in an individual manifests itself.

This capability is entirely independent of the syphilitic affections of the testicles and ovaries, and in fact such a perceptible affection, particularly in the latter, is remarkably rare, in spite of the great frequency of the transmission of syphilis. This, however, need not be surprising, as no one would hold as essential, in the inheritance of phthisis, a tubercular process in the testicles or ovaries of the parents. Fränkel (*l. c.*), then, is entirely in error if he does not believe in inheritance through the ovum, merely for the reason that syphilitic affections of the ovaries are of such rare occurrence, and because at the autopsy of a mother he found no such lesions.

Latency of Parental Syphilis.—If we follow the course of syphilis in an individual in whom the disease is unmodified by any effective or rather active treatment, we find that the visible symptoms (affections of the skin and its connections, of the mucous membranes, the bones, etc.) make their appearance always in an eruptive form, i. e., that, particularly during the first years, in the so-called secondary period, we can reduce all these appearances to certain eruptions, taking place from time to time, separated from each other by more or less lengthy periods, while at the same time no new products of the disease make their appearance. These outbreaks succeed each other at first very quickly, so that it often becomes difficult to separate them, because the products of the previous outbreak still exist when again new lesions are manifest. Those later take place from time to time at longer intervals, and it can thus happen that, when the evidences of the last eruption have already disappeared, and before a new one follows, there is, during a certain period, not a single externally perceptible or palpable symptom of syphilis present upon the still positively syphilitic individual. Such a condition, then, we may designate as one of latency. This latency, however, does not exist during the entire interval between two eruptions; much more, rather, a real complete latency is comparatively rare,

because, even after the involution of the larger portion of the products of the last eruption, there remain in part always for a long time certain obstinate affections—an isolated condylome; one or another variety of papules upon the mucous membrane of the tongue or lips; several enlarged lymphatic glands; a periosteal swelling—also, there may be present other signs of a specific affection, for instance, alopecia.

These intervals between two outbreaks, and the latency of the syphilis occasioned possibly through them, may be explained in two ways. Either the virus is excreted for the most part from the organism through an eruption, and only in certain organs, probably the lymphatic glands, more or less stored away and rendered temporarily innocuous until such time as it may again break forth and occasion general symptoms (Virchow), or the virus circulates continually in the whole organism, the tissues are unsusceptible for a long time to the irritation of the same, owing to a previous eruption, and only by an increase of the virus, or a modification of the tissues (perhaps through external influences, diseases, etc.), do we have another outbreak.

If we now examine into the relation of the symptom of "procreative syphilis" (viz., its transmissibility) to the intervals of eruption and the periods of latency, we find the noteworthy fact that this "symptom" (transmissibility) appears entirely independently of these periods, that it continues uninterruptedly from the commencement of the general syphilitic inoculation throughout a long period of time, and that, as far as we can judge from its visible consequences, viz., from the consecutive succession of the children of the individuals in question, it undergoes also in its intensity no striking modifications, but that there is a gradual and constant decrease, until it is completely extinguished. It is apparent that interruptions of any moment in the constantly decreasing power of transmission occur at the most but seldom, and that then such interruptions may usually be attributed to active anti-syphilitic treatment, which is especially effectual against this power. Particularly in the first years after the beginning of the syphilitic disease—without medical treatment—the birth of a healthy child between two intensely

syphilitic never occurs; and also, during the first years, the birth of a viable syphilitic child, between the almost obligatory premature births and miscarriages, is of the rarest occurrence. From this we have evidence, not only of the possibility, but also of the great frequency of the cases in which *parents with latent syphilis procreate children which are affected with the most positive signs of hereditary syphilis*, even, indeed, in its most pronounced form. Only in the last period of the transmission power, when the parental syphilis is modified to such a degree that the affected children appear fully viable, and their constitutions but slightly injured, the parental inheritance showing itself only in a slight outbreak of specific symptoms relatively late after birth, is to be observed an *occasional* entire absence of the power of transmission—consequently, the birth of an entirely healthy child between two slightly affected ones (*see* Case XII. and the XVI., still to follow).

As, then, the power of transmission of syphilis does not run parallel with the important modifications in the intensity of the visible symptoms in the progenitors, but is rather a peculiarity (quality) in syphilitics more constant in character, decreasing only gradually in intensity, we must say, from this point of view, that of the two theories of the latency of syphilis alluded to above, that has the greater probability which does not suppose an occasional suppression of the virus, and a sudden outbreak of the same in a fresh eruption, but rather that which supposes its continual presence in the entire diseased organism, if even in a variable amount. The latter must certainly be the case, as the transmission takes place quite as well during the interval as during the relapse, and this would further explain the remarkably favorable influence which a mercurial course has upon procreative syphilis, even during the periods of latency.

The Influence of Mercurial Treatment upon Procreative Syphilis.—This subject, although it can only admit of exhaustive discussion in connection with prophylactic therapeutics, must nevertheless be mentioned here, because it affects in the greatest degree all the conditions above spoken of. The influence of a mercurial treatment is of importance in two dif-

ferent ways. Through it the power of transmission may be entirely suppressed, and then an intensely affected and consequently still-born child, or one that is unviable, is followed, even in a very short time, by an entirely healthy child; an event never observed in the spontaneous subsidence of the transmission power. Or the influence of mercury is only a relative one, and evidences itself by the fact that, in spite of a recent outbreak of syphilis in the progenitors shortly before the procreation—which left to itself would have as a consequence almost unexceptionally an abortion, a premature birth, and non-viability of the embryo—the child is born living and viable, and becomes ill only later and in a relatively insignificant form.

Examples of the first-mentioned influence, viz., the complete suppression of the power of transmission, are very numerous in literature, and very often entirely authentically reported. In relation to the father we refer to the above-cited cases of several authors, and my own Case X., reported at the same place. Among them we include also the majority of those cases, reported by the believers in an exclusively maternal transmission, in which syphilitic men procreated healthy children with healthy women. We give the following as an example:

Charrier (*l. c.*) relates that a syphilitic man inoculated his wife, she afterward having three syphilitic children. He underwent repeatedly a mercurial treatment, while his wife was only very incompletely and carelessly treated. Coincidentally with the third confinement of his wife, his mistress gave birth to a healthy child, supposedly by him. This case is—even accepting the illegal paternity as reliable—only to be interpreted in such a manner, that the third child owed its syphilis more to the less thoroughly-treated syphilitic mother, while the father, freed by a mercurial treatment from his disease, procreated with a healthy woman a healthy child.

An appropriate case of my own, in relation to the mother, is the following:

CASE XIII. *A Syphilitic Mother gives Birth first to a Non-viable Syphilitic Child, and after a Thorough Mercurial Treatment, to a Living, Healthy One.*—The woman, aged now

forty years, has from a first marriage two children, aged twelve and eight years, who have always been healthy. In 1870, having in the mean time become a widow, she contracted, illegally, syphilis, followed soon after by a general exanthema. After having been merely locally treated and apparently cured, she conceived in March, by her second husband, and bore,

3. In November, 1871, in the eighth month, a very feeble girl, which became ill from syphilis several days after birth, dying in a short time. The mother at the time suffered frequently with affections of the throat and larynx, lost her hair, and had finally gummata upon the anterior tibial surfaces. Toward the end of 1873 she placed herself under a combined treatment of mercury and iodine, which was continued also during the pregnancy commencing in the early part of 1874. She gave birth,

4. December, 1874, to a vigorous female child, which remained healthy, and still continues so. Six months after her confinement the mother seemed to be very strong, and of good appearance, but had upon the anterior tibial surfaces numerous cicatrices, and several recent tubercular growths.

The following case will serve to illustrate the second point, namely, the decrease of the yet recent power of transmission :

CASE XIV. *The Syphilitic Mother is actively treated with Mercury, and in the Second Year after her Inoculation gives Birth to a Viable Syphilitic Child.*—A woman, who had given birth to three perfectly healthy children, and was then widowed, was primarily infected on the under lip, during the summer of 1870, one year after the birth of the last child ; then followed ulcers of the throat, hoarseness, exanthemata, alopecia. Soon after the outbreak of the general appearances, she placed herself under active mercurial treatment, and appeared at New-Year to be entirely cured. She conceived in March, 1871, and at the end of October, consequently at the end of the eighth month, gave birth to a girl, which at first seemed well, but after fourteen days fell ill with coryza, and had isolated vesicles between the buttocks and upon the soles of the feet, together with papules, and rhagades in the corners of the mouth. The child was cured.

In this case it is certainly not strictly proved that, had no treatment of the syphilis of the mother been employed, the child would have been more intensely affected; but, from the extraordinary infrequency of the birth of viable children, when a very recent (one to two years) non-treated syphilis is transmitted to them, we can confidently regard this modified form of the inherited affection as a result of the mercurial treatment of the mother.

The influence of an active mercurial treatment, which suppresses the procreated syphilis, or considerably modifies its intensity, is, however, not always a definite one, least of all in those cases in which, having been employed during an early period, it has suppressed the power of transmission entirely. But the weakening of the transmission power in point of time is also not always constant. Frequently the effect of the cure is lost in regard to a subsequent child, and upon this rests the explanation of those cases, comparatively rare, where, in a succession of syphilitic children, one of the youngest seems to be more severely affected than one older; if, for instance, a syphilitic child born at term is followed again by one unviable and born prematurely.

CASE XV. *Both Parents syphilitic. After the Birth of the First Syphilitic Child, both are treated with Mercury. Only the next Two Children are influenced by the Treatment. Those born later are again intensely affected.*—K., a tailor, aged thirty-one, begat, in 1865, with his mistress, now aged twenty-seven :

1, a girl, born in February, 1867, which, according to the records of the foundling asylum, and the corresponding statements of the parents, was healthy until four months of age, when it died with intestinal catarrh. About the time of the next conception they were both inoculated—it is unknown which of the two became ill first—and had general syphilis. The child,

2, a boy (1868), was still-born. Both parents now entered the hospital and were placed under treatment by inunction, as also internally. This was followed,

3, in 1870, by the birth of a female child at term, appar-

ently healthy, which died when two months old with whooping-cough.

4. In the middle of 1871, a boy; in six weeks had an eruption, which continued for a year, and then for the most part disappeared. A year and a half later there was still a large condylome *ad anum*. He died in June, 1875, when four years old, with measles.

5. 1872.—An abortion at four months.

6. 1873.—The premature birth of a girl at eight months, lived one day.

7. 1874.—A female child at term, apparently healthy until the fifth week, then had a macular exanthema. Was entirely cured and is now strong.

Both parents, who for several years after their treatment in the hospital had felt entirely well, have suffered from three to four years with nocturnal headaches. The mother is very anæmic, and has a remarkably bad color.

In this case, the strikingly favorable influence of the mercurial treatment, which, immediately after the premature birth at the eighth month of the first child, rendered possible the procreation of a living, perhaps entirely healthy child, and of a second one very slightly affected, lasted only several years; and then followed again, in the fifth and sixth pregnancies, an abortion and a premature birth, and only again in the seventh was a viable, although syphilitic, child born.

VIII. *Duration of the Power of Transmission; Spontaneous Expiration of the Same; its Relation to Tertiary Syphilis in the Parents.*—In general, and *a priori*, we may assert that the power of transmission continues as long as the virus is still present in the parental organism. In certain cases this is, indeed, difficult to decide; but we may say, however, with a great degree of certainty, that, as long as symptoms or lesions, with inoculable qualities, make themselves apparent, the possibility of transmission still continues. "Procreative syphilis" can, however, also probably continue to exist beyond the last outbreak of infecting lesions; for the reason that a very slight amount of virus is fully sufficient to affect specifically the cells of procreation, while it may not be in sufficient amount to bring about a lesion of the skin or

mucous membranes. The special relation which it bears to the non-inoculable, so-called tertiary symptoms will be discussed later.

If, now, with the aid of our material of observation, we proceed to determine statistically the *duration of the power of transmission*, we find it associated, naturally, with certain difficulties. The absolute duration can, therefore, be decided only in the fewest cases; when, for instance, on the one side, the time of the inoculation of the progenitor is known (whether from memory, or from the sudden interruption of the succession of healthy children by the first syphilitic child), and, on the other side, when the cessation of the power of transmission can be proved, by the birth of a healthy child at the close of a succession of syphilitic children, with a continual decrease in the intensity. In most cases, only a fragment of the entire duration of the transmission power, through the succession of births, can be satisfactorily characterized, and, therefore, only an approximate conclusion drawn, in relation to the entire duration of this power. We can only consider two kinds of data as reliable and undoubted: 1. Number of the syphilitic births; 2. Length of time during which syphilitic births continued in each single case. These data are seen from the two following tables:

TABLE I.—*Number of Syphilitic Births in each Marriage.*

| NO. OF SYPHILITIC BIRTHS. | Father alone Syphilitic. | Mother alone Syphilitic. | Both Parents Syphilitic. | Conditions of Inheritance doubtful. | Total. |
|---------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------|
| One..... | 16 | 1 | 5 | 17 | 39 |
| Two..... | 11 | 1 | 6 | 11 | 29 |
| Three..... | 6 | 2 | 4 | 4 | 16 |
| Four..... | 4 | 2 | .. | 5 | 11 |
| Five..... | 3 | 2 | 3 | 3 | 11 |
| Six..... | 3 | 1 | 3 | 1 | 8 |
| Seven..... | .. | 1 | 2 | .. | 3 |
| Eight..... | .. | .. | .. | .. | .. |
| Nine..... | .. | .. | .. | 1 | 1 |
| Ten..... | .. | .. | .. | 1 | 1 |
| | 43 | 10 | 23 | 43 | 119 |

It can be seen from this table that the 330 syphilitic births collected by me are distributed in the 119 marriages

in such a manner that certainly, in a large number of cases (39, 29, and 16), only one to three syphilitic births followed consecutively; it was, however, on the other hand, by no means rare that such a series protracted itself considerably in one and the same marriage; because, in eleven cases, four and five, in eight cases six, and in three cases seven, inoculated children succeeded each other, and one time even the number of nine was reached, as also once, ten.

From this alone we can form an approximate estimate through how long a period the parental transmissible syphilis may preserve its power, if it be in a condition to transmit the disease to from nine to ten consecutive children. The next table will prove statistically what period elapsed in my cases, between the birth of the first and last syphilitic child, in the same marriage. As a matter of course, those marriages with but a single birth are left out of consideration. In relation to the succession of births of two and more, we have the following table:

TABLE II.—*Actual Duration of Transmission.*

| NO. OF YEARS. | Father alone Syphilitic. | Mother alone Syphilitic. | Both Parents Syphilitic. | Conditions of Inheritance doubtful. | Total. |
|---------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------|
| (Single birth)..... | (16) | (1) | (5) | (17) | (39) |
| Two..... | 2 | .. | 2 | 7 | 11 |
| Three..... | 7 | 1 | 4 | 2 | 14 |
| Four..... | 3 | .. | 2 | 3 | 8 |
| Five..... | 5 | 2 | 1 | 7 | 15 |
| Six..... | 6 | 1 | 3 | 3 | 13 |
| Seven..... | .. | 2 | 3 | 1 | 6 |
| Eight..... | 4 | .. | 2 | 1 | 7 |
| Nine..... | .. | 2 | .. | .. | 2 |
| Ten..... | .. | .. | .. | 2 | 2 |
| Eleven..... | .. | 1 | .. | .. | 1 |
| Twelve..... | .. | .. | 1 | .. | 1 |
| | 43 | 10 | 23 | 43 | 119 |

From this table it is at once evident that, disregarding those families with but few children, in a very considerable portion of all cases, the interval between the first and last syphilitic birth extended to five years, and even more; that we find very respectable figures for an actual duration of transmission during six, seven, and eight years, but that in

isolated cases this period reached nine and ten years; and that, in two instances, eleven and twelve years elapsed between the first and last syphilitic child. Consequently, in these cases the power of transmission undoubtedly existed continually in the individual transmitting the disease during all these years.

The following is a case *in extenso* of an actual duration of twelve years:

CASE XVI. *Both Parents syphilitic; Twelve Years' Duration of the Syphilitic Transmission, and Birth of Seven Syphilitic Children. Upon decreasing Transmission-Power, Birth of a Healthy Child between moderately-affected Syphilitic Children.*—The father is now forty-one, the mother forty years old. From 1857-'62 they had five healthy children. During the fifth confinement of his wife the man contracted syphilis, and several weeks later his wife also. She had a macular eruption, lost her hair, so that for a time she was entirely bald, and had very violent headache. I could not ascertain much relative to the condition of the husband. It is certain, however, that neither of the two was subjected to any anti-syphilitic treatment worthy of mention. The subsequent births followed in this manner:

6. 1863.—A boy, still-born in the eighth month.

7. 1864.—A female child, born prematurely at eight months, with an eruption; very feeble; lived only seven days.

8. 1866.—A female child, born prematurely between the seventh and eighth months, died immediately after birth.

9. 1867.—A female child, born prematurely between the seventh and eighth months, lived twelve hours.

10. 1869.—A female child, born at term; had a general eruption, sore lips, snuffles, and died when two years old.

11. 1870.—A female child; fell ill when five weeks old with a maculo-papular eruption, which was cured with proto-iodide, as well as the relapses in the ninth and twentieth months. She died with pneumonia when two years old.

12. 1872.—A girl, born at term; was entirely healthy, and is still so.

13. August, 1874.—A healthy boy. The hereditary affection breaking out at this time made itself apparent only in a

laminated desquamation of the epidermis about the balls of the toes (diffuse syphilitic infiltration of the skin in a moderate degree), and in a nodular or tubercular eruption upon the hands and feet. These appearances disappeared quickly under the proto-iodide of mercury, and the child is still to-day healthy and unusually strong; no relapses.

The mother, during the tenth pregnancy, suffered for several months with complete aphonia and ozæna. At present, it is true, she presents no recent syphilitic symptoms, but is very anæmic, has a scanty growth of hair, and a remarkably nasal tone of voice.

From this last table, however, only the actual duration of transmission in these certain cases is manifest; by no means, though, the entire duration of the transmission-power, as, indeed, in many cases, several years have elapsed between the inoculation of the progenitors and the birth of the first syphilitic child; and, on the other side, the last-born child does not necessarily terminate the succession of syphilitic children, so that the duration of the ability to transmit may exceed the period of actual transmission by many years. So, for instance, just in several of our cases in which the number of years is great, the transmission-power is nevertheless not to be regarded as extinguished, because in some cases the last child was still severely affected; and, consequently, if other births follow, they possess the certain expectancy of a specific inheritance.

CASE XVII. *Birth of a severely-affected Syphilitic Child Ten Years after the Inoculation of the Mother.*—The woman, aged twenty-nine, was inoculated in 1864—in her eighteenth year—by her lover, and fell ill soon afterward with general syphilis, which ran its course without any treatment worthy of note. By him she had two children:

1. At the end of 1865.—A boy, still-born in the seventh month.

2. 1867.—A boy, still-born in the eighth month.

Being now forsaken by her lover, she was married in 1871 to her present husband, and gave birth,

3, 1872, to a boy, still-born at term.

4, 1874 (February), to a girl, which fell ill in the third

week from a maculo-papular exanthema, also in the seventh week from a renewed outbreak of the eruption and a very painful swelling of the epiphyseal connection of the heads of both upper arms, with apparent crippling of both upper extremities. These appearances were removed by mercurial treatment, but there succeeded in the seventh and thirteenth months very obstinate relapses, which have, perhaps, not yet subsided.

As, in this case, the last child, which was born nine years after the inoculation of the mother, was still very severely affected (early eruption, disease of the epiphysis, etc.), and the birth of the same was preceded two years before by one still-born, we can decide here with almost positive certainty, from the analogy with other cases, upon a very marked intensity of the maternal syphilis, and upon an influence of the same still continuing through many years—presuming, of course, that the power of transmission be not brought to an early termination through mercurial treatment.

As, now, it occurred in five of my cases, in which the end of the transmission-power was verified by the birth of an entirely healthy child, that always five to seven years (twice, five; once, six; twice, seven) elapsed between the birth of the last non-viable child (i. e., one born prematurely or still-born, or one born prematurely and dying after several hours) and the birth of the first healthy child, I have, consequently, in those twenty-four cases in which the beginning of the affection was accurately known, added the mean number of six years to the number of years until the birth of the last non-viable child, and have estimated, in this approximate manner, for my cases *a maximum of fourteen years, and an average number of ten years, for the duration of the transmission-power* in a spontaneously decreasing syphilis of the progenitors unmodified by mercurial treatment.¹

In three cases in which the commencement as well as the end of the transmission-power was known, the duration extended twice to ten years and once to seven years. Only in one of the first cases was once, in the course of the time, a mercu-

¹ Hensch (1868) observed even the birth of a child with hereditary syphilis twenty years after the inoculation of the mother.

rial cure employed ; in both other cases the maternal affection ran its course unmolested. We have, accordingly, for my cases, *a minimum of seven years* for the duration of this power.

Relation of the Power of Transmission to Tertiary Parental Syphilis.—All that we have thus far learned of the power of transmission, of its duration, and its spontaneous disappearance, or its extinction brought about by mercurial treatment, is not in the least affected by the fact, which we have here to consider, that, namely, parents with pronounced tertiary syphilitic lesions can procreate children to whom the disease is not transmitted.

We have required, as a *prima conditio* of the transmission-power, the presence of the syphilitic virus in the parental organism. But from the now prevalent, as it appears, entirely correct idea of the so-called tertiary lesions, these are no longer considered to be a localization (*Ablagerung*), or a direct effect of the syphilitic virus, but much more, rather, only the evidences still of a peculiarity of the diseased organism called forth by syphilitic poisoning—whether it be already extinct, or existing only in its last stages—in consequence of which this organism does not react in the usual manner against such irritation as may arise, but, in the furnishing of a cell-growth, shows in the gummata characteristic changes and a peculiar course. Tertiary changes, then, may be already present, so long as the syphilitic virus still circulates within the organism—and then even the virus itself may serve as a source of irritation for the production of gummy products—but also they may still continue to exist after the virus is entirely eliminated or removed.

The relation of the transmission-power to the tertiary symptoms is, therefore, rendered at once entirely clear. The transmission-power may still exist when tertiary symptoms in the progenitor are already developed ; it may, however, have been extinguished for a long period, either spontaneously or through mercurial treatment, while at the same time tertiary products may reign supreme in the parental organism. *The transmission-power is, consequently, entirely independent of the condition of tertiary syphilitic affections in the progenitor.*

There is no lack of instances confirmatory of this assertion, either in literature or in my own personal observations.

Bertin (*l. c.*), Beyer (*l. c.*), and Acton (1851), have already admitted that healthy children may be born of parents with tertiary syphilis.

Virchow (1858) asserts that a man with gummy growths in the testicles procreated two healthy children.

Simon (1850) also relates two cases which belong here: A man with caries syphilitica procreated consecutively several healthy children; a woman with tubercular growths of the subcutaneous cellular tissue gave birth to a healthy child.

Sigmund (1858): A man who suffered seventeen years with bone-syphilis procreated in the fourth year after the beginning of his disease one syphilitic child, and afterward several that were healthy.

Hebra (1860): A man with syphilitic necrosis of the cranial bones procreated in four years three healthy children.

Baerensprung (*l. c.*): In eight cases healthy children were born whose fathers suffered from severe tertiary syphilis, and in seven cases healthy children were born of mothers suffering in the same manner. All were thoroughly and repeatedly treated with mercury. In several cases abortions and premature births preceded the birth of healthy children.

Köbner (*l. c.*): A woman with obstinate tertiary syphilis gave birth first to a child with hereditary syphilis, and then to five children unaffected.

Of my own cases, X. and XIII., already reported, belong here. In the first case a man, immediately after the outbreak of tertiary ulcerative skin-lesions, procreated a healthy child; in the second, the mother suffers with gummata of the skin both before and after the birth of a healthy child. In both cases the transmission-power was suppressed by energetic treatment.

But, on the other hand, I have also observed that parents with pronounced tertiary symptoms still procreated children with hereditary syphilis, as also occurred in the cases reported by Sigmund and Köbner.

CASE XVIII. *Chronic Syphilis of the Father with Tertiary Lesions; Healthy Mother; Syphilis in the Children,*

with gradually-decreasing Severity.—The father, aged now thirty-two, was inoculated in 1865, but was never systematically treated. In 1868 he married a girl aged twenty-three. Since 1869 he has suffered from an ulcer upon the left anterior tibial surface, which from time to time heals and again reappears. The tibia is irregularly thickened; the cicatrix adherent to the bone. Order of the births:

1. December, 1869.—A boy, still-born in the seventh month.

2. August, 1870.—A boy, still-born in the seventh month.

3. September, 1871.—A boy, still-born in the eighth month.

4. September, 1873.—A female child at term; suffered a week after birth from a macular syphilide and specific infiltration of the soles of the feet and palms of the hands; was cured with proto-iodide. She continues, however, very feeble, and is affected with chronic hydrocephalus to a slight degree.

In another case, the mother of three children, with congenital syphilis, their births closely following each other, had, since the time of her second confinement, a gummy tumor in the skin—lower part of the thigh.

The peculiarity of the specifically affected organism which evidences itself by the development of gummy products does not, then, begin just at the moment of the extinction of the syphilitic inoculating and transmitting powers, but may also exist still at a time in common with the latter. It may, though, only first manifest itself after the complete loss of the capability to transmit, and may even continue through several years after such loss or extinction. In the first case the individual affected with syphilis can transmit the disease; in the latter case not; and thus the relation of transmission-power to the tertiary disease explains itself in the most satisfactory manner.

Is the Transmission of Syphilis Unconditional?—Upon this question writers, as a rule, do not express themselves decidedly. Many, though, regard the transmission as not obligatory, believing also that several children of syphilitics remain free, but say nothing whatever as to the conditions of such immunity. Köbner (*l. c.*), for example, says the

transmission of syphilis to the progeny is the general rule, but does not result necessarily, even if the mother, and even if the father also, either before or at the time of conception, were already generally syphilitic.

According to my experience, I must completely reject such views of heredity. I know of but two ways in which parents positively syphilitic can procreate healthy children during the active period of the virus, viz. : *first*, if the mother, after the conception of an embryo not rendered syphilitic by either parent, has only first acquired general syphilis during the pregnancy; and *second*, if the syphilis of the progenitor, just at the time of, or shortly before, conception, were overpowered by very energetic mercurial treatment. In all other cases transmission follows absolutely, as long as syphilis in one or both of the parents is present at the time of procreation, in unmistakable symptoms of the so-called secondary character, furnishing material capable of inoculating.

The following reasons entitle me to this categorical assertion: From Table I. (p. 283) it is evident that in one hundred and nineteen marriages, or other sexual relation, in which either the male or the female, or both, suffered from syphilis, all births resulting from these relations were carefully recorded and tabulated. This gives a total of three hundred and thirty syphilitic births in one hundred and nineteen cases. It is quite plain, partly from what has thus far been said, and will later be still more extensively illustrated, that in all these examples a great regularity is to be found; and that almost unexceptionally, from the first most intensely-affected child until the last one but slightly affected, a regular uninterrupted decrease in the severity of the inherited dyscrasia is apparent. This regularity is so complete in one hundred and nine cases—consequently, in by far the greater majority—that not once do the slightest variations occur; for instance, a severely-affected or viable child is never followed again by a still-birth, etc.; and only in ten cases did such variations appear in the intensity of the disease, which then could be partly attributed to mercurial treatment of the parents. But *never*, in all these three hundred and thirty births, did the birth of a healthy child take place between two severely-diseased chil-

dren, consequently, between the initial abortions and premature births, or between these and those badly affected but viable. On the whole, the birth of healthy children between two syphilitic sisters and brothers was only observed twice (Cases XII. and XVI.); but in both these this irregularity occurred only at the end of the otherwise regular succession of births, and with a transmission-power in the parents of many years' duration, very close upon its extinction. In the second case, the syphilis of the parents was of ten years' standing, and four non-viable and two viable syphilitic children had already been born previous to the birth of the healthy child, which was the seventh, preceding a last unusually slightly-affected one. In the first case, also, the healthy child was born between two fully viable and relatively mildly-affected children, at the close of the series. For a long time previously in both cases, apart from the syphilitic cachexia and the traces of the past disease, no recent syphilitic lesions had made their appearance in the parents.

Apart from these two cases, the birth of healthy children between those syphilitic was never observed. All the other healthy children formed the last link in the chain of births, and in no case could we rightfully consider the duration of parental syphilis as being less than seven years; in the greater number, even, it quite certainly exceeded this period by many years at the time when, at the end of a series continually decreasing in intensity, the first healthy child was born.

If, now, in one hundred and nineteen marriages, syphilitic, and in three hundred and thirty single, syphilitic births, the immunity of the child procreated just in the height of parental syphilis was never observed (although, in fifty-three cases out of one hundred and nineteen, one of the parents very certainly remained free from the disease), we can well say that there can be no question of a facultative inheritance of syphilis; *that much more rather inheritance necessarily follows during the course of syphilis which has been neither extensively treated with mercury nor become weakened through a long succession of years; and that the immunity of the child, if it on the whole occurs, must be reckoned, at all events, among the rarest exceptions.*

All the points thus far discussed relative to the transmission-power in the parents, and all the definite conclusions resulting from these discussions, are of *equal value in relation to both father and mother*; neither have we succeeded here in establishing any real difference in the actual transmission (exclusive of the disturbances of pregnancy occasioned undoubtedly by syphilis in the mother) between male and female syphilitics.

All differences which in general exist—for instance, in the frequency of the transmission from the father or the mother, or in the varied duration of the actual power—have no internal physiological, but depend upon exclusively external, I might say purely social, grounds.

Relative to the *frequency of heredity*, my experience, which in this respect is in complete accord with that of Hutchinson, Rosen, Trousseau, Baerensprung, and others, recognizes a significant balance in favor of the father. For, in my seventy-six cases, in which no doubt existed as to the mode of inheritance, the father alone was syphilitic forty-three times, the mother alone ten times, and both together twenty-three times; accordingly, there results for the father sixty-six and for the mother thirty-three cases, therefore accidentally just the double number for the father. The reason for this is the very simple one, that, in general, there are more syphilitic men than women, and that especially more men are syphilitic previous to their marriage, or other sexual relationship, than women. The most frequent occurrence of all is, that a man, inoculated a long time previously, consummates marriage without at the time having any inoculating lesions; the wife, as a consequence, remaining spared, while the paternal syphilis is inherited by an entire succession of children. The inoculation of the man happens much less frequently after marriage; but, when it does happen, the wife, of course, most generally is also inoculated (twenty-three times); but, even under these circumstances, she may accidentally escape (in my cases four times), and heredity follows then, also exclusively from the father. Cases in which the mother alone is syphilitic at marriage are, upon the whole, very exceptional (in my cases ten

times); and, among these, several (four) contracted the disease during their first marriage.

These circumstances, which, in our field of study, have been derived chiefly from the smaller mechanics and better class of laborers, are in the higher classes still more favorable to the female sex; for the reason that, although the father is very frequently syphilitic before marriage, still they certainly contract syphilis much more seldom after this event, and the introduction of the disease into the family by the wife alone is to be regarded as of the rarest occurrence.

In relation to the *duration of heredity* we have similar conditions. The duration of the *power* to transmit is naturally the same in both sexes, and Baerensprung (*l. c.*) is in error when he regards it as of longer duration in women than in men. As the transmission-power exists as long as the virulent stage of the syphilitic affection, so, consequently, could a difference in the duration of the transmission-power between the two sexes only be possible by a difference in the duration of the disease in general—which, however, is asserted by no one. In truth, we find, in regard to the *actual duration* of heredity, differences again, which have a foundation analogous to the differences found in regard to the frequency of the same. In the relatively rare cases in which the mother alone transmitted syphilis, I found, in fact, a greater average figure, not alone for the duration of actual inheritance (from the birth of the first to that of the last syphilitic child), but also for the number of syphilitic births. From the two tables before given, we have, namely: for the father alone, three and a half years, for the mother alone, six, and for both parents simultaneously diseased, four and a half years, as the average number for the actual duration of transmission, in which a maximum of eleven and twelve years for the mother, and of eight years only for the father, is observed. A similar condition obtains, also, relative to the average number of births. This, again, explains itself simply from the fact that, in a great number of the cases in which the father alone was diseased, he had never married until several years after his inoculation, and, accordingly, the possibilities of a syphilitic transmission on his part falling within these years, were either without result, or, at

least, such results did not come under our observation. On the contrary, in those cases in which the mother alone was inoculated, or else contracted the disease at the same time with the father, it took place for the most part after marriage; the series of births began, consequently, often immediately after the inoculation; and, as the possibilities of transmission from the beginning to the end were given free scope to, we have the greater number of years in favor of the diseased mothers.

Here is also, probably, the most appropriate place to properly set forth the views relative to a supposed *sterility of constitutionally syphilitic women*. The first reference to this subject I find in Behrend (1848), who doubts whether a woman with pronounced lues can conceive, although he himself, in later writings, speaks of repeated births in constitutionally syphilitic women. Mayer (*l. c.*) and Bednar (*l. c.*) state decidedly that a constitutionally syphilitic woman can never become pregnant; and the latter adds, that she only again becomes capable of impregnation when freed from syphilis. Schuller (1864) accepts this assertion in its entirety. Rosen (*l. c.*) believes only in a relative sterility, and bases his opinion upon the infrequency of births among prostitutes. Finally, Zeissl (1875) asserts that women who suffer with inveterate syphilis are generally sterile.

The assertion as to the absolute sterility of syphilitic women, which is really incomprehensible, requires no very serious consideration. A glance at Table I. is amply sufficient. As, also, against a relative sterility, those numerous cases, in which undoubtedly and positively syphilitic women conceive from the beginning of their disease year after year, speak forcibly enough; and it was by no means uncommon that they gave birth to six and seven children. The fact that prostitutes have but few children depends not upon syphilis as a cause, but upon other conditions. Neither has inveterate syphilis any perceptible influence whatever upon the fruitfulness of those suffering in such a manner. If, under this head, we are to include patients with tertiary lesions, we have demonstrated above how often women with tertiary syphilis conceive and bear partly syphilitic and partly healthy children. Should

this question also comprise the absolute duration of the disease, we can only refer to Case XVI., in which births still occurred seven, eight, ten, and twelve years after the beginning of syphilis in the mother. In another case, a woman, who had been affected seven years, and suffered from obstinate psoriasis palmaris, conceived three times in three consecutive years.

The assertion, then, as to the absolute or relative sterility of syphilitic women, has also, in facts, the most striking refutation.

(To be continued.)

Clinical Records from Private and Hospital Practice.

I.—*Intermittent Hemiplegia, with Results of a Post-mortem Examination.*¹ By A. D. ROCKWELL, M. D., Electro-Therapeutist of the New York State Women's Hospital.

THE following case was, in its symptoms and progress, unique, interesting, and instructive; and as a *post mortem* was fortunately obtained, although with difficulty, I think it worthy of brief mention.

C. H. B., a stair-builder, aged forty-nine, and in the seeming enjoyment of a fair degree of health, was suddenly seized, one afternoon in the latter part of July, 1876, and while at work in his shop, with symptoms of dizziness. His power of speech was lost, and the left side became completely paralyzed. In about twenty minutes these symptoms entirely disappeared, leaving him quite well. On the following day he remained quietly in his house during the morning, but in the afternoon resumed work, and at about the same time (4 p. m.) the attack recurred, but with less severity. For some three weeks thereafter paroxysms occurred every other day, and invariably in the latter part of the afternoon, rarely exceeding in duration, however, from ten to fifteen minutes. About the middle of August he was prostrated by a similar but much more

¹ Read before the American Neurological Association, June 8, 1877.

severe attack, this time, however, 11 A. M. being the hour of onset; and thereafter, until the 3d of September, an attack occurred every day at 11 A. M., lasting some fifteen minutes; and between that hour and 4 P. M. the paroxysms would recur from three to four times.

On the 5th, 6th, and 7th of September, the symptoms increased in severity, attacks occurring early every morning, and repeating themselves at intervals of two or three hours during the day. From the day of the first attack until the latter part of August the patient's health remained pretty good; appetite fair; bowels regular; sleep in excess of normal. In the more severe attacks he was utterly unable to walk or speak; in those of less severity he could move with difficulty and speak indistinctly; but in all attacks the sensory symptoms were profoundly marked.

On the 8th of September, when he came under my observation, he was beginning to show the effects of these repeated strokes, in a condition of pallor and general muscular weakness.

As to the sequel of treatment, I give it with some hesitancy, since, in the light of subsequently-ascertained pathological changes, it seems difficult to believe that the method employed, or indeed any form of treatment, could have availed much. I submitted the patient to a mild *séance* of general faradization.

On the following day he returned, stating that no attack had occurred. He received similar treatment, and, in addition, directions to take the small dose of two grains of quinine three times daily. Two days subsequently, when he presented himself, he had had but one slight premonition of his difficulty.

On the 25th of September he was discharged as approximately well, and so remained until December 4th, when I was called to see him.

I found him in his shop in Twenty-eighth Street, with his left side completely paralyzed, articulation imperfect, inability to swallow, but with intelligence unimpaired. He was taken in a sleigh to his home in Harlem, where he died the following night. At a *post mortem* held December 6th, by Dr. Henry T. Pierce—present, Drs. Brockway and Forbes,

and the late Dr. H. H. Gregory—the following conditions were revealed : Venous congestion of the surface of the brain ; pia mater covered with a thin film of organized lymph from old inflammation ; texture of brain softer than normal ; choroid plexus enlarged and cystic ; basilar artery and part of the circle of Willis enlarged and atheromatous, with a considerable amount of serous effusion at the base of the brain. The mitral valve, as well as the liver, was in a condition of fatty degeneration.

No artery was ruptured, neither was we able to detect, in the course of a thorough and careful examination, any evidence of embolism or thrombosis. As the pathological changes above recounted seem hardly sufficient to account for the unusual course of the symptoms, or for the suddenness of death, it becomes of especial interest to consider what was the probable cause. The kidneys were not examined, although it is probable that they were the seat of fatty or other degenerative changes ; but, from the fact that the patient was entirely conscious up to within a few moments of death, it is safe to exclude uræmia as a factor in the production of the final result. In cases where death occurs from the brain, and examination reveals no blood-effusion and no obstruction of vessels, it has been customary to refer to the case as one of simple apoplexy—a nomenclature as unsatisfactory as it is unscientific. Sudden and violent congestion of the brain, causing what Trousseau aptly calls “cerebral surprise,” may, it is believed, be in itself sufficient to produce death ; but the whole history of our patient readily excludes the possibility of this as a cause.

There remains but one other condition in which we may reasonably hope to find an explanation of the above phenomena, viz., a spasm of vessels, which may be supposed to be associated with, or actually caused by, molecular changes in the brain-tissue, rendering it unfit to discharge its proper function. The regularly-intermittent character of these attacks of hemiplegia justified the inference that there was a malarial influence in the case, and renders, perhaps, the temporary results of treatment less unaccountable. The brain was not galvanized, the faradic current alone being used ; but it does not seem difficult to believe that a current of sufficient

tension, applied to the cilio-spinal centre so as to affect the sympathetic and its cervical ganglia, might, either reflexly or directly, exert a beneficial influence upon spasm of the smaller vessels of the brain.

II.—*A Case of Arterio-venous Aneurism in the Thigh, treated by Compression.* By ERSKINE MASON, M. D.

W. S. B., aged twenty-five, Switzerland, by occupation civil engineer, family history good, came under my care at Roosevelt Hospital, September 23, 1873. General condition of patient excellent.

Four years since he received a pistol-shot wound while engaged in a skirmish in South America. He was on horseback at the time the wound was received. The ball entered the left thigh, about two and three-quarter inches below Poupart's ligament, in the line of the femoral artery. It passed directly through the thigh and came out behind, one inch below the gluteo-femoral fold. Immediately there was a large spurt of blood, which was thrown a distance of some two feet, and was bright-red in color. He tore off a piece of his shirt, tied it tightly around the limb above the wound, then, inserting a stick beneath this bandage, twisted it so as to control all bleeding. So much blood, however, had been lost that he came near fainting. That night he was conveyed a long distance on horseback. There was no subsequent hæmorrhage, and the wound had healed up very kindly in about a month. At this time he noticed a pulsation right under the cicatrix. About six weeks after the injury he was able to walk on crutches. Since then he has followed his profession, moving about a great deal, both on his feet and riding on horseback, the thigh not troubling him at all till last June. In this month he jumped off a bank twelve feet high. The following day he had pain and some numbness in the wounded limb, located chiefly above the knee and in the popliteal space. He now noticed that there was a swelling at the site of pulsation beneath the cicatrix. During the month of July and part of August he was under treatment by compression, but at the place where he was treated, in Costa Rica, the only means at

hand was a common tourniquet, and, from his account, it was not kept up for any length at a time. For a month past, while on his journey here, nothing has been done. He now is unable to walk far, on account of pain and weakness in the limb. He says the tumor is increasing, and there is now more numbness in the limb than at any time. At the time of his admission into the hospital there was a pulsating tumor over the course of the left femoral artery, the apex of which is about three inches below Poupart's ligament. When pressure is made upon the artery above the tumor the pulsation stops, and the tumor becomes softer and smaller. There is a *very marked* thrill communicated to the hand when placed over the tumor. Auscultation gives a *very distinct* bruit, or purring, which may be heard also over the popliteal space; the bruit is perfectly characteristic of arterio-venous aneurism. The superficial veins of the leg are not at all enlarged. Measurement of the limb over the apex of the tumor shows that thigh one-eighth of an inch larger than the other one.

Treatment.—At 1 P. M., September 24th, compression was made by placing one pad of a modification of Carte's compressor over the femoral at the brim of the pelvis. The position of the pad was altered at intervals varying from three-quarters to one hour until 9 P. M., when digital pressure was substituted during the night; but it was not efficiently kept up.

25th.—8 A. M. The tourniquet was reapplied, but caused great pain. At 5 P. M., in consultation with my colleague, Dr. Weir, we determined to keep up continual pressure, with the patient under ether; and this was most faithfully accomplished for the period of *eighteen and a half hours*, by the house-surgeon, S. F. Blauvelt, and his staff. During all this time the patient was kept under the influence of ether. Compression was made by two pads of the compressor just above and below the tumor. During the first six hours of etherization vomiting occurred four times, and the patient perspired quite freely. Pulse at times was full and bounding, and was 96 to the minute.

26th.—At about 6 A. M. he began to hicough, and this continued for about an hour and a half. The foot at one time became quite cold; the limb was then wrapped in blankets,

and kept warm. There was no pulsation in the tumor during the eighteen and a half hours that the ether and compression were kept up. When he came from under the influence of the ether the temperature of his body was $99\frac{1}{2}^{\circ}$; that of the foot on the affected side was below 90° ; pulse 76. When compression was removed, pulsation returned at once in the tumor with *almost* the same force as before, and about two hours after compression was stopped the foot became as warm as the other. During this treatment the place of the pads was changed twice, but no blood was allowed to pass into the tumor, the house-surgeon compressing the vessel with his finger while the change was being made.

After coming from under the influence of ether he complained of great pain in the limb, chiefly under the knee and in the foot. At times sensation in the foot was very much blunted, and it was with great difficulty he could move the limb; but, by the aid of friction applied over the whole limb, and the occasional use of the faradic current, these symptoms were relieved in a few days. Though considerable swelling and soreness appeared in the vicinity where the compression was made, no sloughing or even excoriation of the skin followed.

27th.—He complained of considerable scalding in the urethra when passing water (while under ether the urine was drawn by catheter). His urine was not increased during treatment, but in color was darker than usual.

October 5th.—It was noted that the wall of the aneurism was thicker and harder, and that pulsation was less than before compression was resorted to.

12th.—Has troublesome tingling pains in the foot and leg when the limb is at all dependent. The tumor is growing smaller and harder all the time.

13th.—No further interference at present being indicated, the patient was discharged "improved."

A few days later patient left the city for his home in South America, promising that I should hear from him how he progressed, and, if he had further trouble, to return for other operative interference. I regret to have to state that thus far I have heard nothing from him.

I have deferred till this time publishing the particulars of this interesting case, believing that I would be enabled to give the ultimate result of the case. Though, at the time the patient left the city, he was by no means cured, yet he was greatly relieved, the pulsation diminishing, and the tumor smaller, with its walls considerably thickened.

Cases of arterio-venous aneurism occurring in the upper portion of the thigh are not of very frequent occurrence. Mr. Holmes, in his lecture on aneurism, in the *Lancet* of October 17, 1874, refers to but thirteen cases, though he states that more might be found by diligent search through the journals.

The case reported presents several points of interest. As to the mode of treatment adopted, compression, I preferred to try that first, before resorting to the operation performed by Mr. Spence. The aneurism having been of so long standing, the femoral, just as it entered and left the sac, would probably have been so dilated, and its coats otherwise so much changed, that I feared the ligature might prove disastrous, though I contemplated ligation in case compression failed. Compression in this case was used longer, I believe, than ever before in any similar case, and, probably, with very favorable result; else, I think, I should have heard further from the case. It is to be noted, however, that when the compression was removed, pulsation returned with *almost* the same force as before, but in a day or so diminution took place with thickening of the sac-walls. This I account for by the supposition that during treatment the opening of communication between the vein and sac became plugged, and afterward coagulation in the sac gradually took place. Mr. Spence's case, just alluded to (*Edinburgh Medical Journal*, July, 1869), was of recent origin. It was in a boy, aged 15; the aneurism was five inches and eight lines below the middle of Poupart's ligament. The compression was tried by means of Carte's compressor; but so great were the pain and interference with the venous circulation which it produced, that it had to be stopped, and the artery was therefore tied above and below the sac, April 8, 1868. The lower ligature came away on the twelfth day; he had slight secondary hæmorrhage on the twenty-fifth day. On the 11th of May the upper ligature was removed, and the patient

made a good recovery. Since the publication of this case, Mr. Annandale has recorded a case, in which he laid open an arterio-venous aneurism in the thigh, and tied both the vein and artery with success (Holmes's "Surgery").

Of the various operations that have been performed for this form of aneurism, involving the femoral, we believe, after compression, in point of safety, comes the operation of Mr. Spence. The old operation, as lately performed by Mr. Annandale, is fraught with great danger, as several recorded cases show, the interference with the vein having been followed by gangrene and death of the patient. When the femoral alone has been tied above the tumor, as in Dr. Dorsey's case, death followed from secondary hæmorrhage. Here the artery involved was the popliteal, and the femoral was tied in the middle of the thigh; while, according to Mr. Holmes, in the lecture before referred to, all recorded instances of ligature of the external iliac or femoral above the tumor only, for this form of aneurism, have proved fatal.

As this form of arterio-venous lesion, unlike varix, has a strong tendency to increase and prove more and more troublesome, the sooner the patient is operated on, when once the tumor has formed, the better the prospect for success; then the artery just above and below the tumor is in better condition for the reception of the ligature or the use of compression.

Notes of Hospital Practice.

MOUNT SINAI HOSPITAL.

Use of the Permanent Bath.—Considerable benefit has been obtained from the use of the permanent bath in a case of septicæmia, complicated with bed-sores. The advantage has been that, while the temperature was kept down, the pressure on the sacral region was relieved, and, as a result, granulation occurred. The history of the patient was as follows: A woman, aged twenty, had suffered from disease of the hip-joint for an indefinite period. Three months and a half before admission, suppuration took place, and continued until she entered hospital. It was then found that an abscess existed in

the neighborhood of the joint. This was aspirated, and a large amount of pus withdrawn. Septicæmia shortly afterward developed, which was accompanied with the usual elevated temperature and depression of the physical powers. Two weeks after the septicæmia became pronounced, a bed-sore was noticed. It extended over the whole of the sacrum, and in connection with the discharge of pus rendered the patient extremely offensive to the ward. In order to reduce the temperature, and at the same time to relieve the sacrum of pressure, it was decided to place the patient in a permanent bath in a manner something similar to the method practiced by Hebra in the treatment of some forms of skin-diseases. An ordinary bath-tub was arranged, and, after being filled with water at about eighty degrees, the patient was placed in it. A wide muslin bandage was adapted, so that the upper part of the body was partially supported, and a similar bandage kept the extremities from resting on the lower portion of the tub. After the patient was placed in position, the temperature fell four degrees. The pain of the bed-sores was in great part relieved, and after a few days they were found to be granulating. The bath was kept at the proper temperature by adding warm water every few hours. It was found, however, that it became offensive after two days, and had to be renewed.

The patient was removed after a week, but the change proved the advantage of the bath, inasmuch as the pain returned, and the temperature rose two degrees on the second day. On the third day the patient was again placed in the bath, with a result similar to that noticed in the first instance.

Vertical Extension in Fracture of Femur.—A child was taken into hospital suffering from a simple fracture of each femur. An apparatus was devised for the purpose of maintaining vertical extension, and proved of marked utility. The advantage gained was, that no disturbance of the fractured bones took place while the necessary changes in regard to cleanliness were being made. In a previous case it was found that, when horizontal extension was practiced, the fragments were disturbed every time the child evacuated its bowels.

ST. FRANCIS'S HOSPITAL.

Hernia—Perforation.—A man entered hospital, suffering from an irreducible hernia, complicated with perforation. The hernia filled the scrotum, and presented a sinus which led into the intestine.

The most interesting feature of the case was that, one minute after taking a drink of water, the fluid passed out of the sinus in a stream. The most satisfactory explanation of the case would be that a fistula extended from the stomach or duodenum down to the opening in the scrotum.

Dislocation into the Ischiatic Notch.—A man entered hospital, stating that he had injured his thigh six weeks before admission. The extremity was found shortened to the extent of half an inch. The leg was flexed on the thigh, and the thigh on the abdomen, but there was no inversion or eversion of the foot. On making an examination with the finger in the rectum, the head of the femur was found to rest in the ischiatic notch. Reduction was attempted by means of extension and manipulation, but without effect.

CHARITY HOSPITAL.

Obscure Skin Disease.—A patient is at present under observation, who presents an anomalous form of skin disease. The eruption is most marked on the face and hands, and is elevated to the extent of from one-fourth to one-half an inch. Each elevation has an average area of from one to two inches, and presents many of the characteristics of an epithelial growth.

BELLEVUE HOSPITAL.

Caries of the Bones of Foot; Teale's Amputation.—An interesting case of caries of the bones of the leg and foot was recently under observation in hospital, and was noteworthy from the fact that it originated from an injury received while jumping. On admission, the ankle was found to present numerous

sinuses leading down to dead bone in the astragalus, scaphoid, tibia, and fibula. The patient preferred that an operation should be performed which would allow of his resuming his occupation, and for this reason it was at first determined to perform Syme's operation; but, on examining the tibia and fibula, they were found to be cheesy for four and a half inches above the ankle-joint. Teale's operation was then considered most available, and was performed in the usual manner by the house-surgeon, Dr. M. Burke, the anterior flap forming a square, one side of which was equal to half the circumference of the limb, the posterior flap being half the length of the anterior. Esmarch's bandage was employed, but after it was removed free hæmorrhage took place. The operation was carried out according to Lister's method, but the mistake was made of not introducing a drainage-tube into the wound. On the ninth day an abscess was detected, which, on being opened, discharged twelve ounces of pus. A drainage-tube was then inserted, and after twenty-four hours all purulent discharge ceased.

The greater part of the wound healed by first intention, and by the fifteenth day suppuration had entirely ceased.

Longitudinal Fracture of Skull.—A boy received a longitudinal fracture of the skull by a brick falling upon his head, and, on examination after entering hospital, it was noticed that the dura mater was caught between the edges of the broken bone. An ice bag was applied, and kept in position for ten days, at the end of which time all signs of inflammation had disappeared. The wound healed up, but subsequently opened and discharged a small portion of necrosed bone.

Clinical Reports of the Demilt Dispensary.

CLASS IN DISEASES OF WOMEN.

BY DR. H. T. HANES.

I REPORT the following cases not because there is anything uncommon either in lesion or treatment, but because they are

the types of those diseases that are liable to fall under the care of the general practitioner sooner or later. They are of that class, also, in which judicious treatment will always be of service, and where procrastination and empiricism will certainly result in great and often permanent injury.

Anteflexion, with Severe Dysmenorrhœa.—January 27, 1877.—M. B., native of Ireland, twenty-nine years of age; married four years; never pregnant; first menstrual flow at sixteen years; last menstrual flow January 15th.

Symptoms.—Has severe bearing-down pains during menstruation; much irritability of bladder. Been troubled in this way for three years, and is growing worse. Flow appears every four weeks. Many clots of blood. Has constant leucorrhœa, with much pain in back between menstrual epochs. Appetite good.

Patient is a stout, ruddy, healthy-looking woman.

Physical Examination.—Vagina normal; cervix in position; much transparent, tenacious mucus oozing from external os. A sharp angle is distinctly felt at junction of cervix with body on anterior wall. Cusco's bivalve speculum introduced; with double tenaculum firmly grasping the anterior lip of cervix, one point within the canal, the other opposite, the organ is drawn down and slightly straightened as the anterior wall strikes the upper blade of speculum. Sound, after being considerably bent, passes with great difficulty through internal os; point comes forward. Rotation of sound caused the angle of anterior wall to disappear.

Diagnosis.—Marked anteflexion at the junction of cervix with body of uterus.

Treatment.—Firmly holding the cervix with the double tenaculum, I dilated under ether to No. 20 American scale (see *Medical Record*, September 25, 1875, p. 655), Dr. H. H. Hogan assisting. The No. 16 dilator was rotated, and the uterus held retroflexed for five minutes. Then, in quick succession, the remaining dilators were introduced while the organ was still retroflexed. No. 20 was held *in situ* for fifteen minutes. With Dr. Sims's curette considerable hypertrophied and easily-broken-down mucous membrane was removed from the cavity of the uterus. Cotton, saturated in a strong solu-

tion of carbolic acid, was then applied to the endometrium by means of the applicator and glass tube.¹ A cotton ball (with string attached) saturated with glycerine and solution of morphia was then introduced and left in the vagina. Gave opium *pro re nata*. Patient to remain in bed five days. Ordered injections of alum and chlorate of potash in large quantities of warm water daily. Cotton to be removed the following day.

February 28th.—No untoward symptoms; some uterine discharge. Sound passes easily. Last menstrual flow attended with but little pain. To continue the injections.

March 20th.—Doing well. Sound passes easily. Treatment by injections to be continued.

April 7th.—Patient much improved. Uterine canal straight. Sound passes easily. Some uterine discharge. Dilate to No. 12, and made application to uterine cavity of carbolic-acid solution.

June 10th.—Well.

Anteflexion at the Junction of Cervix with Body.—*January 12, 1877.*—E. S., native of Ireland, twenty-four, single. First menstrual flow at sixteen years, last menstrual flow January 1st.

Symptoms.—Excessive pain at time of menstruation. For the past few months has been obliged to remain in bed, and “feared she should become insane at these periods.” Says she has grown irritable and nervous. Has constant desire to urinate, but is not relieved by the act. Bowels constipated.

¹ [This instrument I have been in the habit of using for four years. It is very simple, consisting of a small glass tube six inches in length, bent at the distal end to correspond with the normal axis of the canal of the vagina and uterus. The common applicator is first passed completely through this tube; the end afterward is tightly wound with cotton, and this is saturated with the medicament to be used. Then, by *retracting* the applicator, the end with the medicated cotton may be drawn within, and protected by the glass tube. This is now passed through the dilated cervical canal. Directly it is within the internal os, the glass tube may be withdrawn, leaving the medicated cotton immediately in contact with the diseased mucous membrane. By means of this instrument any medication can be safely carried through a healthy vagina or cervical canal.]

Appetite poor. Patient is a fairly-nourished, well-developed woman.

Physical Examination.—Vagina normal, cervix small, axis of cervix normal, os externum medium. On passing finger along anterior wall of cervix, the other hand pressing upon the fundus through the abdominal wall at the same time, a sharp angle is detected at the junction of cervix and body. The uterus is quite small and easily moved. A small Cusco's bivalve speculum was now used. Holding the uterus with double tenaculum, I then attempted to introduce a Simpson's uterine sound, but it met with an obstruction at the internal os. By bending the sound near the end, and introducing it with the concavity forward, it passed within the uterine cavity two and one-third inches, causing intense pain. Removed the speculum and rotated the sound within the cavity, caused the angle of the anterior wall to disappear.

Diagnosis.—Acute ante flexion at the junction of cervix with body of uterus.

Treatment.—*January 24th.*—Gave ether and dilated, Dr. H. H. Hogan assisting. No. 16 dilator was rotated, and the uterus retroflexed and held five minutes in that condition. Nos. 17, 18, 19, and 20, were then introduced in quick succession before the uterus could regain an ante flexed condition. The last dilator was held *in situ* with the uterus retroflexed for fifteen minutes. The speculum was then removed, and a pledget of cotton saturated in glycerine, with twenty minims of Magendie's solution of morphine added, was introduced into the vagina. A string was attached to the pledget, and allowed to protrude without the vulva, that the patient might remove it on the following day. Opium was administered *pro re nata*. Patient ordered to remain in bed for five days.

31st.—Patient has had no unpleasant symptoms. Sound with normal curve passes easily and causes but little pain.

February 10th.—Menses this week: "Never so easy before."

May 12th.—Has had no uterine pains. Menses normal as to time, duration, and quantity. Sound with normal curve passes easily.

Congestion of the Endometrium, commonly called Uterine

Catarrh, with Prolapsus of First Degree.—November 25, 1875. —Ellen B., native of Ireland, twenty-two; single; first menstruated at fifteen years; last menstrual flow, November 10th. Menses last two days only, accompanied with great pain. Menstruation has always been painful. No pain between menstrual epochs. Has constant leucorrhœa, profuse at times, of a transparent and tenacious character. Patient, a healthy-looking servant-girl.

Physical examination revealed hymen perfect; parts extremely sensitive, cervix low down; os slightly open. Thorough examination impossible without ether.

Diagnosis.—Uterine catarrh with prolapsus uteri of first degree.

Treatment.—The first object of treatment was to reduce the hyperæsthesia of the parts by a course of warm flax-seed-tea injections, and dilatation of the ostium vaginæ by means of a syringe. To accomplish this the patient was directed to inject, with a Davidson syringe, a quart of warm flax-seed tea three times a day for three days; at the end of that time, to use a pint of flax-seed tea with a teaspoonful of chlorate of potash, four times a day, with a female hard-rubber or glass syringe.

December 14th.—Patient has been using injections to date. Thorough examination now feasible. A small bivalve speculum reveals a red congested condition of os externum, which is patent, with glairy, tenacious, translucent fluid oozing from it. Dilated easily to No. 12 American scale. Scarified the endometrium with Thomas's curette; applied a strong solution of carbolic acid in the usual manner, upon cotton, by means of applicator. Raised uterus into normal position with pledgets of glycerinized cotton.

16th.—Removed cotton; order flax-seed-tea injections to be continued with Davidson syringe.

January 2d.—Has continued treatment. Last menstrual flow was of three days' duration, and painless. Uterus is nearly in normal position. Applied carbolic acid to endometrium in usual manner; patient is to continue injections.

12th.—Doing well; to continue injections of warm water only.

February 10th.—No pain at menstrual flow, and no leucorrhœa. Uterus has been in position for six weeks.

Uterine and Cervical Catarrh.—*March 13, 1876.*—Mrs. J., native of United States; twenty; married nine months.

Symptoms.—Severe backache and vesical trouble; much pain during sexual intercourse; profuse leucorrhœa. Has “no appetite.” Is growing thin and nervous. Bowels constipated. Was well before marriage. Leucorrhœa commenced two months after marriage.

Patient, a tall, well-proportioned blonde.

Physical Examination.—Vagina slightly congested; some vaginal discharge. Cervix in position, swollen and painful. Red granular condition of os externum. Much uterine discharge, of a tenacious, translucent character, was removed from cervical canal. Sound passes easily, external os fully patent. Rotation of sound within uterine cavity caused considerable pain and some hæmorrhage.

Diagnosis.—Chronic congestion of endometrium and trachelium (uterine and cervical catarrh).

Treatment.—Dilated to No. 12 American scale, without ether, and used Thomas’s curette freely to endometrium. Afterward applied solution of nitrate of silver (3j to ʒj) to uterine cavity in usual manner. Ordered frequent vaginal injections of warm water with chlorate of potash and alum; cease all work, and avoid sexual intercourse; syrup phosphate of iron internally; Lady Webster dinner-pills *pro re nata*.

March 18th.—Much improved. Continued vaginal injections.

April 3d.—Was requested to visit patient at her home. Found that she had been suffering intensely for eight hours with pelvic pains. Vaginal examination revealed uterus completely retroverted. Patient was placed in the knee-chest position, and the organ quickly and easily replaced. A medium-sized Albert Smith pessary was placed *in situ*. Injections to be continued.

30th.—Uterus has kept in position. Removed pessary,

and applied a strong solution of carbolic acid to endometrium in usual manner. Pessary replaced, and patient directed to continue vaginal injections.

May 15th.—Less leucorrhœal discharge. No pains in back. Carbolic acid solution applied to endometrium as before. To continue injections.

30th.—Improving. Treatment continued.

July 31st.—Removed pessary. Some slight granular condition still existing around external os. Less uterine leucorrhœa. Carbolic acid was applied to uterine cavity, as before. Vaginal injections to be continued.

August 25th.—Patient improving; "slight leucorrhœal discharge." Found vagina normal, some uterine discharge, and external os still congested. Last menstrual flow painless, lasting four days. Dilated to No. 12, and scarified endometrium with a Thomas's curette. Applied carbolic-acid solution, as before, to uterine cavity. Continue chlorate-of-potash and warm-water injections.

October 15th.—Been very much better until a few days since, when some leucorrhœa returned. On examination, slight congestion of endometrium still existed. Applied, as before, carbolic acid to uterine cavity. Continue injections once a day.

December 4th.—Patient has not menstruated this month. Has gastric and mammary symptoms of pregnancy. Uterus slightly increased in weight, soft and patulous around cervix, and retroverted in second degree. Reapplied the former pessary after an easy reduction of the organ, while patient was in the knee-chest position.

8th.—No menstruation as yet; uterus in position. Signs of pregnancy still more marked.

January 2d, 1877.—Full two months pregnant; but little leucorrhœa. Discontinue hot-water injections.

February 10th.—Removed pessary; uterus in position.

June 27, 1877.—Has now nearly completed a quite comfortable gestation.

August 17th.—She was delivered of a ten-pound female child August 2d. Mother and child doing well.

The following case illustrates what can be accomplished

by judicious medication in arresting the progress of the disease in a patient suffering from

Epithelioma of the Cervix Uteri.—February 1, 1877.—Mrs. S., native of Ireland, forty-four years old; married twenty years; several children; last living child, November 14, 1872. In June, 1873, miscarried at six months; cause unknown. December, 1874, had a second miscarriage, at third month; cause unknown. Since this time, for more than two years, patient's health has been failing. Menstrual flow profuse. Often between periods would lose blood for a couple of days at a time. Sometimes slight watery discharge from vagina; severe backache. Sexual intercourse painful, and followed by a discharge of blood from the parts. Has lost twenty-five pounds in weight during this time; has a poor appetite, and for the past three months has been in destitute circumstances, and consequently unable to obtain sufficient suitable nourishment.

Patient evidently much emaciated, with that peculiar anxious, cachectic expression which indicates a painful constitutional disease.

Physical Examination.—A dark, grumous, fetid fluid is found exuding from the vagina. Cervix uteri in normal position, but ragged and uneven around external os. Finger could be crowded up cervical canal for one-half inch. Tissue slightly gritty to the feel, and easily broken down, bleeding freely. The sound passed easily through internal os after entering the canal above the diseased portion for three and a half inches. Placing patient in knee-chest position, with Sims's speculum it was found that the cervix around external os and lower portion of cervical canal was diseased. The fungous growth was red and granular. The surrounding cervix was smooth, swollen, and slightly indurated.

Diagnosis.—Epithelioma of the cervix commencing at external os. Diagnosis confirmed, at a later date, by Dr. E. R. Peaslee.

Treatment.—Patient placed in knee-elbow position. Applied strong solution of perchloride of iron and muriatic acid (℞. Liq. ferri perchl. ʒij; acidi muriat. ʒj, M.), by means of a glass rod, to the affected parts. Five minutes afterward the

whole of the diseased tissue was scraped away with a Sims's curette, and a fresh application made of the same medication, to the slightly-infiltrated base. Opium was given *pro re nata*; compound tincture of cinchona and the muriated tincture of iron were ordered, and arrangements made for improved diet, including an abundance of milk. Ordered injection of warm water with alum and carbolic acid once a day.

February 5th.—Has suffered great pain. To continue same remedies. No application made to-day.

9th.—Quite comfortable; much less pain; no hæmorrhage for several days. Iron and acid again applied to diseased surface; and all fungous growth removed with curette, as before.

March 10th.—Disease has made no progress since last treatment; size of cervix much diminished; ulcerated surface diminished one-half. Again applied iron and acid. Continued tonics; opium *pro re nata*.

April 10th.—General improvement of patient and disease. Iron and acid has been applied every two weeks. Has had no hæmorrhage excepting at menstrual epoch, when it is still profuse.

June 8th.—Patient in better condition. Some erosion still existing about external os. No pain in or about pelvic organs. Same treatment to be continued.

CLASS IN DISEASES OF THE EYE AND EAR.

BY DR. EDWARD T. ELY.

Hæmorrhagic Neuro-Retinitis, followed by Irido-choroiditis with increased tension. Panophthalmitis and Loss of Sight.—Mrs. C. (colored), married, aged thirty-three, came to the dispensary March 2, 1877, with the following history: Ten days ago, while washing dishes, a "sudden cloud" came over her right eye. Vision of that eye has been very poor since. Eye has not been red or painful; knows no cause for attack; feels well generally; denies venereal and intemperance. Had rheumatism for a month twelve years

ago; has pains in her bones sometimes at night now. Past two years has had palpitations and shortness of breath after exertion. For the past two months has had pain in right brow and running back to occiput, but not of severe character.

Is of good general appearance. Heart appears to be hypertrophied, and a murmur is heard with the first sound, loudest over base. Some enlargement of cervical glands. Urine contains albumen and casts.

Right eye: external appearance natural, except slight divergence. Counts fingers with difficulty at one foot, and at temporal side of the visual field. Pupil slightly dilated and sluggish; media clear; optic disk blurred and swollen; retinal veins large and very tortuous; large irregular patches of exudation scattered over whole fundus except at periphery; numerous hæmorrhages into retina; peculiar appearance around macula, as if the retina were gathered into radiating folds, fastened at the macula itself by a little button, the whole being of greenish color. Tension normal.

Left eye: vision normal with $-\frac{1}{8}$ glass. Appearance of fundus normal.

March 7th.—No change seen in fundus. Noticed peculiar *wavy* appearance of cornea, as if it were covered by mucus. No appreciable increase of tension. An hour later the cornea had become clear again.

11th.—Stippled appearance of cornea, obscuring view of fundus. No increase of tension. Cornea clear again when patient was seen, two days later, and no special change observable in fundus.

18th.—Has irido-choroiditis. No cause assigned. Humors so cloudy that fundus cannot be seen. Severe pain in eye. Leeches and atropine ordered.

22d.—Inflammation more severe. Tension decidedly increased. Paracentesis of cornea was done, with effect of relieving pain.

24th.—Paracentesis repeated on account of pain and increased tension.

After this date the eye became steadily worse, the condition passing into that of panophthalmitis. No view of the

fundus was obtained after March 15th. When last seen the eye was totally blind; cornea tolerably clear; anterior chamber filled with blood, and sclerotic about corneal margin thinned, and beginning to be staphylomatous.

The patient took mercury and iodide of potash on account of the suspicion of syphilis. She also took iron and bark, and had such local treatment as seemed indicated. Perhaps an iridectomy would have been of some service, but it is doubtful whether it would have averted the final loss of sight.

Effect of Exhaustion of the Air from the Membrana Tympani, and of Paracentesis of the Membrana Tympani in Chronic Non-suppurative Inflammation of the Middle Ear.

—During the past few months the above methods of treatment have been tried in a few selected cases of chronic non-suppurative inflammation of the middle ear. Only patients were selected in which the usual treatment by inflation, etc., pursued for from one to three months, had failed; and, of these, some proved unavailable on account of irregular attendance. Hence, the number reported is not so large as desired. The cases were such as appeared to be typical ones of chronic catarrhal and proliferous inflammation far advanced. In eight such cases a faithful trial was made of exhausting the air from the external auditory canal and membrana tympani for a month or longer. Some of the patients said they always “felt better” after the operation, and requested its repetition; and in some there was a very slight improvement in hearing, which, however, always disappeared before the next visit.

The final effect upon the hearing and tinnitus was in all cases negative.

Four similar cases were treated by paracentesis of the drum-head. The operation was performed from two to five times in each case. Here, also, the results were entirely negative.

One case, not in the above category, was seen, in which exhaustion of the air from the drum-head gave great relief to the tinnitus. The patient was a woman, aged thirty-seven, who seemed to have had nerve-deafness in the left ear for twelve years. During that period she had suffered from distressing tinnitus on that side, and it was that which led her

to seek relief. She described two noises, one like a bell and the other like a blowing off of steam, both constant. Both drum-heads were very much depressed, and had no light spots; but the hearing on the right side was normal, and there was no other evidence of catarrhal trouble. The left ear was inflated three months, with no relief to the tinnitus. Patient also took iron and iodide of potash, without benefit. Exhaustion of the air from the membrana tympani was then tried. After the first trial of the remedy the bell-sound disappeared. The other noise diminished steadily, until, after four weeks' treatment, it was so slight as to give no inconvenience. The patient was seen four months later, and had suffered no relapse.

Kennedy's extract of pinus Canadensis has been used in obstinate cases of chronic suppuration of the middle ears, with apparent benefit. In one case—that of a little girl six years old, who had had suppuration on both sides for two years, and who had been treated a good part of the time—the discharge ceased, and the drum-heads cicatrized after five applications of the remedy. The pure extract was used, and it was applied lightly to the raw surface by a cotton-holder. If applied too thickly, or daubed over the walls of the canal, it hardens, and is difficult of removal.

Severe Symptoms caused by a Small Amount of Hard Wax. Entire Relief by Treatment.—A female, aged twenty, came to the class, with the following history: Had a discharge from her ears at the age of four. Does not think she has had any since. For the past few years has noticed impairment of hearing occasionally. For the past three months has had a constant noise in her head “like a steam-engine,” and has had occasional pains through her ears. For the past month has had a good deal of giddiness, and feeling as if she were about to fall over. Thinks the sensation has always been as of falling toward the right side, but is not certain about this. Noises of the street “jar her head” and cause headache.

H.-D. R. $\frac{1}{4}$ $\frac{3}{4}$; L. $\frac{3}{4}$.

Flakes of hard wax are seen resting on both drum-heads, and preventing view of them. Syringing causes vertigo and

pains shooting up into orbits, and can only be borne for a few seconds.

The wax was removed gradually by several syringings, and the drum-heads were then seen to be cicatricial. The hearing-distance became $\frac{3}{4}$ each side, and the unpleasant symptoms were entirely relieved. Inflation made the hearing-distance normal. The condition was the same three months afterward. Although there were some signs of catarrhal trouble in this case, I think the patient's sufferings were almost wholly caused by the impacted wax.

Bibliographical and Literary Notes.

ART. I.—*The Cure of Rupture, Reducible and Irreducible, also of Varicocele and Hydrocele, by New Methods.* By GEORGE HEATON, M. D. Edited by J. H. DAVENPORT, M. D. Boston: H. O. Houghton & Co., 1877.

THIS treatise advocates a simple method of treating radically all forms of herniæ, and one which, in the author's experience, has proved successful in "hundreds" of cases. Dr. Heaton discards Gerdy's, Wutzer's, and Wood's operation, because too much inflammation is apt to be excited, and, even when success has apparently been attained, there is a tendency of Nature to get rid of the tissues (which have been invaginated), which are like foreign bodies in the canal—and the rupture usually recurs. A cure can, however, be accomplished by *strengthening* the fibrous tissues, "which are Nature's chief bulwark against hernia." This is the object of his "method of tendinous irritation," which is carried out by the injection of fluid extract of quercus alba into the fibrous borders of the abdominal rings. An instrument similar to a hypodermic syringe is employed, and ten minims of the solution is sufficient for one operation. If properly done, no more severe effect should be produced than dull pain for several hours, and tenderness lasting several days. A pad and bandage are applied immediately after the injection, and are to be worn for six or eight weeks, or longer in cases of omental

hernia. A truss may be substituted for the bandage when the patient begins to move about, say at the end of a week, or when all local tenderness has disappeared; but, as a rule, the bandage is to be preferred. If possible, the sac as well as its contents should be returned to the abdomen before the injection is made.

Irreducible herniæ are converted into reducible by manipulation or by surgical interference. By means of "simple taxis patiently persevered in," the author has "succeeded in reducing herniæ which had been apparently irreducible for five, ten, or twenty years and more." In case of failure, the ring is dilated by invaginating the finger, and taxis again tried. Subcutaneous "nicking" of the tissues about the ring has been employed successfully; and, finally, cutting into the sac and dissecting away the adhesions, and returning the whole or a part of the protrusion—an operation which the author considers "safe, trustworthy, and efficient, and no more to be dreaded than any other surgical operation of moderate importance."

The book is well and clearly written, and issued in admirable form by the publishers. Notes of many cases are appended. It is to be hoped that Dr. Heaton's method may be tried by other surgeons. There are but few in this country who advocate the severer operations for the radical cure of hernia, and to even these this simple plan of treatment is to be highly recommended.

In varicocele the ligation of the veins separately with silver wire (subcutaneously) is advised, and in hydrocele the powdered red precipitate is recommended in place of tincture of iodine.

ART. II.—*Annual Report of the Supervising Surgeon-General of the Marine-Hospital Service of the United States, for the Fiscal Year 1875.* By JOHN M. WOODWORTH, M. D. 8vo, pp. viii.-229. Washington: Government Printing-Office, 1876.

THE body of the work, the Fourth Annual Report of the Supervising Surgeon of the United States Marine-Hospital

Service, comprises reports, statistics, and illustrative charts. The Appendix is devoted to the consideration of certain scientific questions relating to the service.

The report itself gives a general outlook of the medical field of the marine service, sets forth some improvements already made, and includes some further suggestions. We notice one improvement in the service which has been adopted only since 1873, namely: a regulation requiring all medical officers of the Navy to pass a thorough examination previous to appointment. As this is only a regulation, Dr. Woodworth very justly recommends that the statutes be amended accordingly, in order to prevent any attempt to ignore or override the order.

In the Appendix the contributed papers are: "Yellow-Fever at Key West in 1875," by Surgeon R. D. MURRAY; "Yellow-Fever at Barrancas in 1875," by Surgeon JAMES S. HERRON; "Yellow-Fever at New Orleans and Pascagoula in 1875," by Surgeon JOHN VANSANT; "Syphilis and Chancroid," by Surgeon P. H. BAILHACHE; "Consumption," by Surgeon A. C. HAMLIN; "Scurvy," by Surgeon C. N. ELLINWOOD; "The Life-Saving Service," by Assistant-Surgeon H. W. SAWTELLE; "The Seton in Paralysis and Epilepsy," by Surgeon T. J. GRIFFITHS; and "Ships' Medicine-Chests," by Surgeon MURRAY.

While all of these articles are very good, we would call especial attention to the remarks of Surgeon Bailhache on the prevention of syphilis. It is time that some systematic measures, by way of judicious legislation, were taken to suppress this great scourge of the human race.

ART. III.—*Transactions of the Medical Society of the State of Pennsylvania, at its Twenty-seventh Annual Session, held at Philadelphia, May 31 and June 1, 1876.* Vol. XI., Part I. 8vo, pp. 347. Philadelphia: Published by the Society, 1876.

THIS volume of the "Transactions of the Pennsylvania Medical Society" abounds but little in scientific productions of special merit.

The "Minutes of the Proceedings" occupy about forty pages, after which appears the address of the President, Dr. CRAWFORD IRWIN.

A "Memorial," signed by several medical gentlemen, contains some very good remarks on insanity.

The "Address in Obstetrics," by R. DAVIS, A. B., M. D., is a very good paper, the treatment of placenta prævia being the theme discussed.

The "Address in Surgery," by D. HAYES AGNEW, M. D., LL. D., is a *résumé* of the advances in surgery during the year. It is full of interest, and, on account of its comprehensiveness, is the most valuable of the articles in the volume.

The "Address in Hygiene," by BENJAMIN LEE, A. M., M. D., comprises an inquiry into the purity of water-supplies in different parts of the State. The author makes some very valuable remarks, based upon the reports from the several county medical societies of the previous year.

"Criminal Abortion; its Extent and Prevention," is the subject of some very truthful remarks by ANDREW NEVINGER, M. D.

The remainder of the volume is made up of reports from county medical societies, together with the constitution, by-laws, and codes of medical ethics of the State of Pennsylvania.

ART. IV.—*Centennial Discourse on Public Hygiene and State Preventive Medicine.* Delivered before the International Medical Congress, held in Philadelphia, September, 1876. By HENRY I. BOWDITCH, M. D., etc. With Extracts from Correspondence from the Various States and Territories of this Country, and from several American Colleges. To which is added a *Digest of National and State Sanitary Law during the Centenary.* By HENRY G. PICKERING, Esq. 12mo, pp. xii.-176. Boston: John Wilson & Son, 1877.

THE work before us is greatly enlarged from the discourse read before the International Congress mentioned on the title-

page, being fuller in detail and somewhat wider in scope. The efforts of Dr. Bowditch are so familiar to the profession, and to the laity in certain parts, that comments upon the value of the dissertation are useless. The author gives a history of sanitary reform, involving much patient and searching inquiry, showing its past and present status, as well as its struggles for supremacy. It is claimed that more than two hundred thousand persons are "slaughtered" annually in the United States by preventable disease; and upon this fact a strong argument is based in favor of "State Preventive Medicine." The work should be in the hands of everybody.

ART. V.—*Second Annual Report of the Board of Health of the State of Georgia*, 1876. 8vo, pp. 198–lxxxviii. Atlanta: J. P. Harrison, 1877.

WE are glad to see States falling into line in the establishment of State Boards of Health. The Georgia State Board have issued a good-sized volume for their Second Annual Report. In addition to statistical matter, proceedings of the board, etc., etc., the volume contains a very elaborate report of the "Late Epidemic of Yellow-Fever." This report is very exhaustive, extending inquiries into all conditions likely to affect the development, progress, and cure of yellow-fever. It contains many interesting points. The board also make a short report on "Lunacy in Georgia." The Appendix (88 pages) comprises, for the most part, evidence bearing upon yellow-fever.

ART. VI.—*Transactions of the Pathological Society of Philadelphia*. Vol. VI. Containing the Report of the Proceedings for the Session from September, 1875, to July, 1876. Edited by JAMES TYSON, M. D., etc. 8vo, pp. xxvi.–157. Philadelphia: J. B. Lippincott & Co., 1877.

THE previous volumes of the Philadelphia Pathological Society are too well known to the profession for the present

one to require an extended notice at our hands. It is handsomely gotten up, and comprises the history and autopsy of cases of disease occurring in nearly every section of the body. This publication embraces the proceedings of one year only.

BOOKS AND PAMPHLETS RECEIVED.—Report of Cases of Phimosis and Adherent Prepuce. By John C. Huff, M. D. Reprinted from the "Transactions of the Medical Society of West Virginia," 1877.

Cyclopædia of the Practice of Medicine. Edited by Dr. H. Von Ziemsen, Professor of Clinical Medicine in Munich, Bavaria. Vol. XV. Diseases of the Kidney. By Prof. Carl Bartels, of Kiel, and Prof. Wilhelm Ebstein, of Göttingen. Translated by Reginald Southey, M. D., of London, and Robert Bertolet, M. D., of Philadelphia. Albert H. Buck, M. D., New York, editor of American edition. New York: William Wood & Co., 1877.

Medical and Surgical Reports of the Boston City Hospital. Second Series. Edited by David W. Cheever, M. D., and F. W. Draper, M. D. Boston: Published by the Board of Trustees, 1877. Pp. 316.

Reports on the Progress of Medicine.

CONTRIBUTED BY DRs. EDWARD FRANKEL AND GEORGE R. CUTTER.

SURGERY.

Poison from Splenic Gangrene.—Dr. P. Voss has made a number of experiments, in the pathological laboratory of Christiania, with the splenic blood of a cow, dead from gangrene of the spleen (*Norsk Mag. f. Lægevid.*, R. 3, Bd. 6). An immense number of rod-shaped bacteria were found in the blood. They were considerably thicker than the ordinary putrefactive bacteria, and occurred in three different lengths. The longest were always two or three times as long as the shortest ones, and often bent at an angle corresponding to the length of the shortest rods. A *résumé* is also given of the prevailing views concerning this poison, its mode of propagation, condition of contagiousness, and the various known forms in which the disease appears in man.

The experiments were made on Guinea pigs with blood containing splenic-gangrene poison, either undiluted, diluted, or filtered, and thereby deprived of its bacteria, and, finally, with putrid blood. Five of the six animals died in the course of one to two and a half days, according to the degree of dilution and the quantity of the injected blood, which was from one-third to several drops. One case in which filtered blood was used ran the same course as the others, and presented the same *post-mortem* appearances. Specimens of blood taken during life from the ear presented, as a rule, bacteria. On section, there were found œdematous con-

nective tissue, fluid dark blood, and a bloody, soft spleen. The rod-bacteria were found in the heart's blood, and in especially large numbers in the spleen, where they were at least quite as numerous as the red blood-corpuscles. The sixth animal was inoculated with highly diluted and filtered blood from the cow's spleen with a cataract needle. The animal showed no reaction after the inoculation. The investigator ascribes this negative result in part to the inappropriate instrument, in part to the extreme dilution of the material. Fifteen days later the same animal received an injection of dilute, stinking, putrid blood, which presented numerous putrefactive bacteria, but in which the previously mentioned characteristic bacteria had disappeared during the process of putrefaction. The animal died in two and a half days. The spleen was scarcely swollen, light red, not hyperæmic. A few putrefactive bacteria, but none of the characteristic rods, were found in any of the animal's organs. The animal was regarded as having died from septicæmia, consequent on the injection of such a large quantity of putrid matter.—*Nordiskt Medicinskt Arkiv*, Bd. 9, Häft 1. G. R. C.

Pus in Peritoneal Cavity treated by Incision and Carbolic Injections.—Dr. J. A. Selmer reports (*Norsk Mag. f. Lægevid.*, R. 3, Bd. 6) the case of a strongly-built man, about forty-five years of age, who presented symptoms of peritonitis, located in the right hypochondrium. He had meteorism, vomiting, fever, etc. This condition lasted for a number of weeks, and, in spite of treatment, he slowly grew worse. The abdomen slowly enlarged, especially on the right side. The liver was pushed up to the fourth rib. There were considerable dyspnœa, cyanosis, and collapse, and death appeared imminent. An exploratory puncture with Pravaz's syringe showing pus, a trocar was entered near the costal border, and a large quantity of pus evacuated. As all the pus could not thus be evacuated, an elastic catheter was inserted and a solution of carbolic acid in water was injected twice a day. The pulse and respiration improved immediately, the collapse and cyanosis disappeared, and the abdomen contracted. The following day the catheter became choked, and the distention increased. A transverse incision was made through the puncture wound, three inches in length. A tin catheter was passed through the incision as far up as the liver and down to the groin. The cavity was now completely emptied of pus, and the wound dressed with a carbolized compress. On the tenth day the secretion of pus had nearly ceased, and the general condition was good. A steady progress was made to recovery.

Dr. J. Holmboe reports, in the same journal, the case of a girl, fifteen years of age, who had, without any known cause, rigors pain in the abdomen, and vomiting. Peritonitis was diagnosed. Four days later there was a profuse diarrhœa, which lasted several days. The abdomen became distended, and the diaphragm was pushed up. These phenomena gradually diminished under treatment. Six weeks later a fluctuating tumor, about the size of a goose-egg, was detected at the lower portion of the left side. It constantly increased in size, the pulse became quite rapid, and there was some fever. About ten weeks after the commencement of the disease there were severe cough, spitting of pus, and symptoms of infiltration of the left lung beneath the spina scapulæ. The tumor extended farther up in the abdomen, and farther inward over the median line. A few days later considerable pus was evacuated through the rectum. Pressure on the tumor increased the expectoration of pus. An exploratory puncture having shown pus, an incision two inches long was made in the linea alba, between the navel and symphysis. More than a quart of pus escaped. A catheter was inserted and injections of carbolized water made. The patient rapidly recovered.—*Nordiskt Medicinskt Arkiv*, Bd. 9, Häft 1.

G. R. C.

Paralysis of the Ulnar Nerve, due to a little-known Cause.—In 1874, Dr. Ponas, Surgeon of Lariboisière Hospital, communicated to the Parisian Academy of Medicine his researches on paralysis of the radial nerve, by which he showed that the paralysis supposed to be due to the influence of cold was traceable to compression of the nerve during sleep. Before the same Society, February 12, 1877 (*Gazette Médicale*, 7, 1877), the subject of paralysis of the ulnar nerve was brought forward by the same author; and the observations likewise proved the pathological condition to be a paralytic neuritis of local origin. The following cases were related: In the first case, in a young man of nineteen years, there were a progressive paralysis of the ulnar nerve and alteration of the nutrition of the nerve at the bend of the elbow. The peculiar feature of the case was, that the cause was only a sesamoid bone the size of a bean developed in the tissue of the internal lateral ligament of the elbow. In its growth this bone had pressed on the ulnar nerve, giving rise to pain spontaneous and on pressure, and paralysis of the muscles below. After the extirpation of the sesamoid bone, which the author believed to be an exostosis of the semi-lunar fossa, the patient died of suppurative arthritis of the joint. Histological examination of the swollen and neuromatous portion of the paralyzed nerve revealed at this portion a chronic hyperplastic neuritis, undoubtedly provoked by pressure of the foreign body. The neuritis was characterized by a proliferation of the connective tissue of the nerve, with hyperæmia, while the much-compressed nerve-tubes, as if strangulated by the mass of connective tissue, had undergone considerable diminution in volume.—The second case referred to a lesion of the ulnar nerve, the cause being a fracture of the elbow twelve years previous. That fractures of the trochlea are sometimes complicated with paralysis of the ulnar nerve, is a well-known fact. A novel feature, however, of the case is that it appeared twelve years after the fracture. This may be explained by assuming that the nerve, rendered superficial by the callus thrown out, was exposed to external violence, from which the hyperplastic neuritis, etc., developed. The paralysis and muscular atrophy had advanced to a marked degree in the patient, a man of forty, of robust constitution. Nevertheless, electrization accomplished a cure, the interrupted current being first used, and later the continued current.—The third case was one of progressive paralysis of the ulnar nerve from a chronic neuritis, which set in six months after violent frictions of the elbow while rowing for several hours. The trunk of the nerve was swollen above the elbow, and the limb was emaciated. Electricity and cold douches cured this case in six months.—The fourth and last case was an example of incomplete paralysis of the ulnar nerve, produced by an augmentation in volume of the trochlea from dry arthritis of the humero-cubital articulation. The nerve at the elbow had become swollen and painful.—From these cases the following conclusions may be drawn:

From various causes (development of a sesamoid in the internal lateral ligament of the elbow; old fracture of the trochlea; prolonged functional compression; deformity from arthritis) the ulnar nerve, rendered more superficial, is exposed to frequent external violence. This causes a chronic neuritis, followed by paralysis of the muscles of the forearm and hand. Electricity constitutes the treatment *par excellence*. In these relatively rare cases of exostosis, or any other morbid production, an operation under the antiseptic plan may be advisable. The cause of the neuritis having been removed, or the paralysis cured, Dr. Ponas suggests, to guard against its return, the wearing of a metallic cap over the elbow, so as to prevent the infliction of violence to the nerve.

E. F.

Cases of Gonorrhœal Arthritis.—M. Le Dentu communicates (*Gazette Médicale*, 7, 1877) a further case of blennorrhœal coxalgia in a robust

young man of eighteen, without antecedent morbid history, who entered Hôtel-Dieu for the relief of intense pain at the side of the vertebral column and toward the sacro-iliac junction. Percussion at the anterior superior iliac spinous process and rectal touch exasperated suffering. These symptoms had appeared about fifteen days before, and the patient attributed them to over-fatigue. It was ascertained that the patient also had a urethral discharge five weeks previous. The father of the patient had been a sufferer from acute articular rheumatism. Recovery in three weeks. MM. Deleus, Tillaux, and Siredey, agreed with the author in recognizing the connection between the gonorrhœa and the rheumatism, they having had similar cases under observation.

The *Gazette Médicale de Bordeaux* publishes a case by Dr. Durodié of blennorrhœal arthritis of the temporo-maxillary articulation—a very rare disease, the statistics of 119 cases collected by Fournier showing only six cases in which the lower jaw was implicated. Aside from gonorrhœal complications, the rheumatic affection of this joint is rare. In this case the patient, forty-two years old, was affected with gonorrhœa for the first time, but had had rheumatism at the age of twenty, which affected all the articulations of the upper and lower extremities. On the fifteenth day of the gonorrhœa the discharge began to diminish, and a violent pain with tumefaction set in at the temporo-maxillary articulation, soon developing all the symptoms of an acute arthritis. The inflammation abated under the influence of leeches, complete immobility, and narcotic fomentations, and the patient could open his mouth four days later. In eight days the arthritis had entirely disappeared, and the discharge reappeared, but with less intensity. E. F.

Operation for Coccygodynia, by Svenson.—A lady fifty-five years of age had suffered more than one year from pains in the region of the coccyx, which commenced without ascertainable cause, at first were endurable, but gradually increased. Admitted into hospital May 9, 1872. The patient complained of moderate pain in the sacral region and very intense pain in the coccyx. The latter was always present, exacerbated when she turned in bed, sat, and arose. Supine position was unbearable, and the pain frequently deprived her of sleep. Nothing else morbid could be detected. Manual examination revealed nothing abnormal as regards position or movability of the coccyx; intense pain was developed on the slightest pressure on the apex of the bone. Vesication, morphine injections, electricity, etc., having been ineffectually tried, the author, on June 5th, introduced a tenotome close to the coccyx and divided all ligaments, nerves, etc., connected with the bone, excepting those which maintained its articulation with the sacrum. Immediately after the operation a very large hematoma developed, pressing the posterior wall of the rectum against the anterior, and causing considerable tenesmus, which was relieved by ice and morphine injections. When the patient returned home, on June 22d, the sensibility of the operated part was still so considerable that the result was uncertain. Improvement was noticeable about one month later, which continued until January, 1873, when she was nearly well. According to information received from her in December, 1875, she could sit, lie, arise, etc., without pain, but still felt a certain weakness in the sacral region, which was especially marked after emotional excitement and when remaining long in the sitting posture. At the operation the author took special care to isolate the coccyx from the coccygeal gland which lies in front of its apex. Luschka, in his "Anatomy of Man," declares his suspicion that some relation may exist between this gland and the coccygodynia. Although this has not yet been proved, it does not seem improbable.—*Memorabil., Med.-chir. Wechschrift.* E. F.

Dressing of Wounds with Camphorated Alcohol.—At a recent meeting

of the Surgical Society (*Gazette Médicale*, 17, 1877), the merits of this method of treating wounds was discussed. MM. Deleus, Guyon, and Desprès, spoke in favor of it. The tincture, of a strength of 40 to 100, is applied either over the wound up to the tenth or fifteenth day, until all danger of complications has passed, and then the usual dressing is resumed: or, immediately after the operation, a pledget of lint, saturated with strong alcohol, is placed at the bottom of the wound, and retained until detached by suppuration, being moistened daily with a watery solution of camphor. The advantages are supposed to be that there is no redness or tumefaction on the third day (local reaction slight, only one case in ninety-one amputations having had erysipelas); that the alcohol serves to obliterate the arterioles and venules, which might give rise to hæmorrhages and absorb putrid products. This dressing is essentially antiphlogistic, retarding inflammatory accidents; but when the wound is anfractuous, and all portions are not in contact with the alcohol, inflammation survenes. Suppuration is small in quantity, and cicatrization is slow; it may therefore be advisable, later, to apply a stimulating dressing. M. Duplay thought that this method had no advantage over others; indeed, had the disadvantage of causing most intense pain and retarding cicatrization. E. F.

On Anæsthesia by Injection of Chloral.—Tizzoni and Togliata establish the following conclusions on a basis of forty experiments: 1. Chloral injected into the veins does not act as a true anæsthetic, but is simply a strong hypnotic. The sensibility of the skin disappears only when very large doses are administered; the cornea almost never loses its sensibility. 2 and 3. Anæsthesia by chloral is very dangerous. The effect varies very much in different individuals, and cannot be diminished when too powerful. Phlebitis arises easily. The amount of water injected is also harmful, aside from the danger of injecting air. Chloral is a cardiac poison, and, when injected, causes death by paralysis of the heart in forced diastole; while, when applied locally to the heart, it causes its tetanic contraction. 4. Nor is the subcutaneous injection of chloral advisable for the purpose of anæsthesia, as it is absorbed very slowly, and gangrenous abscesses are easily produced. 5. The best antidote against chloral is the cold douche on the head and back, while injections of strychnia, quinine, atropine, and worare are harmful. It is useless to suspend the body with the head downward.—*Alg. med. Centr.-Z.—Med.-chir. C.-Bl.* E. F.

On the Diagnosis and Prognosis of Malignant Lymphadenoma.—M. Trélat recently read an interesting paper on this subject before the Société de Chirurgie (*Gazette Médicale*, 10, 1877). He referred to the case of a patient on whom he had operated in 1872, and who had died while under the influence of chloroform. This patient was admitted into La Pitié for a small tumor of the neck, which had grown very slowly, and was accompanied by glandular engorgement. He likewise had another but very small tumor on the thigh. At the autopsy similar formations were found in the viscera and vertebræ. Histological examination revealed that these tumors had the same composition—that of lymphadenomata. M. Trélat said that malignant lymphadenoma was an affection of rapid general diffusion, and which often should not be operated on. With M. Ponas, he had concluded to abstain from all intervention if an examination of the patient revealed an implication of the viscera. A large, vigorous, intelligent man of fifty-six years entered Charity Hospital in 1876, affected with a tumor of the left testicle. At the age of twelve years he had received a kick in the scrotum. At the age of military service he was retired for disease of the left testicle. He married, and had successively fourteen children. At the age of forty-eight he noticed a slight swelling of the left testicle, which was disregarded, the patient not entering the hospital until eight

years later. The diagnosis was difficult; the tumor was smooth, resistant, comprising both testicle and epididymis. There was no effusion into the tunica vaginalis; the cord was slightly enlarged; there was but little pain, and the general health was excellent. At the upper portion of the eyebrow there was a small flabby tumor, similar to the small fatty tumor so frequently met with. Antisyphilitic treatment was negative. The slowness of growth excluded carcinoma, and the absence of glandular implication, epithelioma; the diagnosis, therefore, inclined toward sarcoma. The tumor was removed by castration, and on section was of a grayish-red color, similar to renal tissue. Here and there were disseminated grayish points and hæmorrhages. At the end of fifteen days the patient left the hospital in good condition. M. Malassez, on examining the tumor, found it to be a lymphadenoma. The patient remained well until the summer, when a new bump appeared on the left temple, and the right testicle began to grow, soon after followed by another bump on the right temple. There was no doubt now of the generalization of the disease. Emaciation progressed rapidly, and the patient died in a thoroughly cachectic condition. At the autopsy, analogous tumors were found in the liver, spleen, mesentery, mesenteric glands, the vertebræ and sternum, all of which were lymphadenomata. These two cases have led M. Trélat to establish the following rules: When in the presence of a tumor, manifestly a neoplasm, there is another small tumor in another part of the body, it is advisable to remove the latter for histological examination. If proved to be a lymphadenoma, intervention against the general affection is useless. The generalization of lymphadenoma is most insidious, and an operation often tends to hasten it.

E. F.

PHYSIOLOGY.

*A New Method for the Quantitative Determination of Sugar in Blood.*¹ (By F. W. PAVY, F.R.S.).—Dr. Pavy described minutely his new method for the quantitative determination of glucose, and its application to physiological relations of sugar in the animal system. The accurate results which Dr. Pavy has succeeded in obtaining by means of his new gravimetric process of analysis, and the importance of the subject itself, are such as will tend to advance materially our knowledge, and hence will substantiate and extend the position with regard to the treatment and pathology of diabetes.

The paper consisted chiefly of a description of the method which the author adopted for accurately ascertaining the amount of sugar in the blood of animals, and formed the prelude to one which was to be read on Thursday, June 21st, in which Dr. Pavy was to give the results obtained by the application of his method as follows:

1. The natural state of the blood.
2. The comparative state of arterial and venous blood.
3. The spontaneous change ensuing in blood after its removal from the system.

Before describing his own gravimetric system Dr. Pavy proceeded to criticise Bernard's new volumetric process, which has been described fully in recent issues of the *Comptes Rendus*. This method the author proved

¹ Abstract of a paper read before the Royal Society, June 14, 1877.

to be not only devoid of precision as a quantitative analytical process, but was in itself calculated to give rise to fallacious results, inasmuch as keeping the suboxide of copper dissolved by means of organic matter was fundamentally wrong. The entire system was based on errors, and the results were necessarily incorrect; two of these errors the author dealt with somewhat in detail. The first was in the assumption that the volume of trial liquid corresponds in c.c. with four-fifths of their weights in grammes of the mixture of sulphate of soda and blood. In practice it was found that the actual relation between the volume of liquid obtained and the weight of the mixture employed must vary in each individual case, according to the solid matter existing in the particular specimen of blood and the loss of liquid by evaporation during the separation of the coagulum by heat. The other error in Bernard's method arose from the influence which organic matter exerted in preventing the deposition of suboxide. The large addition of potash which is employed in this process, viz., from 20 to 25 cubic centimetres of a concentrated solution to one c.c. of the copper test, acts upon some one or other of the organic principles left in the liquid obtained from the blood, and prevents the deposition of suboxide of copper.

The author then proceeded to describe his own new gravimetric process, in which he adopts the use of a galvanic battery for effecting the deposition of copper which has been reduced by the sugar in a form to be susceptible of weighing. The details of this method are, shortly, as follows:

A certain volume of blood—about 20 c.c. forms a convenient quantity—is taken for analysis, and first mixed with 40 grammes of sulphate of soda; the whole must be subjected to weighing in detail, so that the precise weight of the blood taken may be known. To this mixture, contained in a beaker of about 200 c.c. capacity, about 30 c.c. of hot concentrated solution of sulphate of soda are added, and the whole contents heated until a coagulum is formed.

Filtration is then performed, and the coagulum thoroughly washed, so that all traces of sugar may be removed. The liquid thus obtained, from having been run and squeezed through muslin, is slightly turbid, and must be boiled again and filtered through paper to render it perfectly clear. It is now ready for the application of the copper-test. Being brought to a state of ebullition, about 10 c.c. of the potassio-tartrate of copper solution, or sufficient to secure that the test-liquid is left in excess, are added, and brisk boiling continued for a minute, but not longer. In this way a reduction of the oxide to the suboxide of copper is effected by the action of the sugar present in the solution.

The liquid is then filtered through a plug of asbestos, or, what is better, glass-wool. The suboxide, having been collected and washed from excess of the copper-test liquid, is next dissolved by a few drops of nitric acid, a small quantity of peroxide of hydrogen having been previously added in order to effect oxidation and consequent ready solution.

The copper present in the liquid is now deposited by the agency of galvanism. The positive pole of the battery is formed by a platinum spiral coil, around which, and forming the negative pole, is a cylinder of platinum-foil; upon this the copper is slowly deposited in a pure metallic form. This operation is continued until the appropriate test shows that the whole of the copper has been thrown down. The period ordinarily required to effect this does not exceed twenty-four hours.

The platinum cylinder is next removed, and instantly plunged first into distilled water, and then into alcohol. After drying in a water-oven it is ready for weighing. The difference in the weight of the cylinder before and after the operation gives the amount of copper deposited.

The battery used is a modification of Fuller's Mercury Bichromate Battery, and has been selected on account of the constancy of its action.

From the amount of copper deposited, that of the sugar existing in the blood analyzed may be accurately calculated. Five atoms of the cupric oxide of the test solution are reduced by one atom of glucose; it follows that three hundred and seventeen parts of copper represent the equivalent of one part of glucose, or the relation stands as one of copper to 0.5678 of glucose. Therefore, to ascertain the amount of sugar, the weight of the copper has to be multiplied by 0.5678. This application of the copper-test solution yields a gravimetric instead of a volumetric process of analysis, and one which has no uncertainty belonging to it. There is nothing for the mind to decide, and no opportunity for error of judgment, as may be the case, to a slight extent, where a gradual fading of color—as in the volumetric process—has to be watched until the attainment of the proper point of the decoloration has been effected.

The accuracy and reliability of the foregoing process are strongly supported by the uniformity in the results obtained from a large number of experiments. Compared with the results yielded by this gravimetric process, those obtained by Bernard present the greatest discordancy. The figures he gives are invariably too high, and there is no intelligible relation in the differences noticeable, suggesting that there is something radically wrong in taking decoloration without precipitation of suboxide as a means of estimating the amount of sugar. Dr. Pavy supports this assertion by the conclusions derived from a large number of experiments.

Miscellany.

Appointments, Honors, etc.—Dr. J. H. Pooley, Professor of Surgery in Starling Medical College, Columbus, Ohio, has accepted a call to Hanover, N. H., to complete the course of lectures begun in Dartmouth Medical College by the late Prof. A. B. Crosby. Dr. L. A. Sayre has been giving demonstrations in London of his method of treating diseases of the spine by the plaster bandage. Dr. T. D. Crothers, Assistant Physician at the Binghamton State Inebriate Asylum, has resigned, to become Superintendent of the Asylum at Walnut Hill, Hartford, Conn., which will be opened for the reception of patients on the 1st of October. The Chair of Theory and Practice in the Medical Department of Yale College has been offered to Dr. G. W. Russell, of Hartford, Conn. Oscar, the King of Sweden and Norway, has conferred the decoration of Knight Commander of the Norwegian Order of Olaf upon Prof. William Pepper, in acknowledgment for services ren-

dered to the Norwegian Commission at the Centennial Exhibition.

The Medical Register.—The fifteenth volume of this indispensable little volume is in many respects an improvement on the Registers of previous years. It contains a complete list of the physicians of New York, New Jersey, and Connecticut, giving a total of four thousand eight hundred and forty-four names. The membership in local societies is given for all the physicians of the cities of New York and Brooklyn, in addition to the date and place of graduation of each. We regret to learn from the preface that the editor, Dr. A. E. M. Purdy, does not receive sufficient encouragement from the physicians of the States represented to repay him for the time and labor devoted to the excellent work of registration, and that it is doubtful if he will undertake another edition. Dr. Purdy has done the profession an incalculable service in the preparation of the Register for many years past, and it is sincerely to be hoped that it will appear regularly in future under the same able editorship.

Sayre's Bathing-Splint.—We have been shown an admirable arrangement for enabling persons afflicted with hip-disease to enjoy the pleasure and advantage of sea-bathing. It is a splint made in all respects like those used by Dr. Sayre, and covered with India-rubber. The steel rods are thoroughly covered with rubber, as well as the band for the waist; in fact, the whole instrument is so covered as to protect it entirely from the sea-water. It is applied when the ordinary one is removed, and with its use a most important object is gained, as it allows the patient the benefit of bathing without danger to the limb. It is manufactured by John Reynders & Co., of this city.

A Rival of Simpson.—The *Lancet* of June 30th contains a long communication from M. C. Furnell, M. D., F. R. C. S., in which the writer claims that he produced anæsthesia on his own person by the inhalation of dilute chloroform (chloric

ether), and recommended its use to others as an anæsthetic in the spring of 1847. As Simpson's discovery of the same phenomenon was not made until November of the same year, Dr. Furnell claims to have anticipated him by several months, though he appears to have had no idea of the importance of the discovery. He says he "thought no more about chloroform and its discovery until 1874," when a letter of inquiry was addressed him on the subject.

The Tyranny of Fashion Abroad.—The *Lancet*, in an article on dress, laments the rigid notions of propriety that render a suitable and comfortable change of clothing in hot weather impossible to Englishmen, and says on this subject: "There are probably few physicians who would have the hardihood to present themselves at the door of a patient, covered with a felt or even a straw hat, let the sun's rays be ever so unbearable."

Death from Chloroform.—The *Toronto Globe* of July 20th reports the death, July 18th, from chloroform, of a patient in the Toronto General Hospital. It was stated at the coroner's inquest that not more than two drachms of chloroform were administered, and that it was given drop by drop. The patient was a woman on whom it was intended to perform some slight operation. The *post-mortem* revealed fatty degeneration of the heart.

Destruction of a Hospital by Fire.—St. Boniface's Hospital, under the management of the Sisters of the Franciscan Order, situated in South St. Louis, was totally destroyed by fire August 6th. All the patients were safely removed. The building and furniture cost forty thousand dollars three years ago.

Boylston Medical Prize Questions.—At the annual meeting of the Boylston Medical Committee, held June 4, 1877, it was voted that no dissertation worthy of a prize had been offered on either of the subjects proposed for 1877.

The following are the questions proposed for 1878:

1. Antiseptic Treatment. What are its essential details? How are they best carried out in practical form?

2. Diphtheria: its causes, diagnosis, and treatment.

The author of a dissertation considered worthy of a prize, on either of the subjects proposed for 1878, will be entitled to a premium of seventy-five dollars.

Dissertations on the above subjects must be transmitted, postpaid, to J. B. S. Jackson, M. D., Boston, *on or before the first Wednesday in April, 1878.*

The following are the questions proposed for 1879:

1. The relation of animal contact to the disease known as hydrophobia.

2. Evidences showing that so-called "filth-diseases" are not dependent upon "filth."

The author of a dissertation considered worthy of a prize, on either of the subjects proposed for 1879, will be entitled to a premium of two hundred dollars.

Dissertations on these subjects must be transmitted as above, on or before the first Wednesday in April, 1879.

Each dissertation must be accompanied by a sealed packet, on which shall be written some device or sentence, and within which shall be inclosed the writer's name and residence. The same device or sentence is to be written on the dissertation to which the packet is attached.

The writer of each dissertation is expected to transmit his communication to the President of the Committee, J. B. S. Jackson, M. D., in a distinct and plain handwriting, *and with the pages bound in book-form*, within the time specified.

Any clew by which the authorship of a dissertation is made known to the committee will debar such dissertation from competition.

Preference will be given to dissertations which exhibit original work.

All unsuccessful dissertations are deposited with the secretary, from whom they may be obtained, with the sealed packet unopened, if called for within one year after they have been received.

The Late Dr. Crosby.—At a meeting of the Faculty of the Bellevue Hospital Medical College, held August 10, 1877, on motion, it was unanimously

Resolved, That this faculty humbly bow in submission, but with saddened hearts, to the Almighty, who in his inscrutable providence has suddenly stricken down, in the meridian

of his career, one of its most gifted and beloved members, ALPHEUS B. CROSBY.

Resolved, That in this visitation it has lost one of its most cultured, kind, impressive, and brilliant lecturers; one who, in imparting his valuable lessons, made study a pleasure, by combining with his wealth of learning an aptitude of illustration, mingled with wit and humor, that crowded his class-room with enthusiastic and admiring scholars.

Resolved, That the members of the faculty mourn the loss of one of their most accomplished and genial colleagues; one whose presence at their official and social reunions was always hailed with delight.

Resolved, That, in his death, we feel that Bellevue Hospital has been bereaved of one of its most skilled and faithful surgeons; the medical profession of one of its most eminent practitioners; the country of one of its noblest citizens, who both in war and in peace contributed his talents and energies with patriotic zeal in its behalf.

Resolved, That we offer our sincere sympathy to his wife and family in this trying ordeal; that, while we are powerless to assuage their grief, we commend them to the sweet memories of his useful life, and to the tender mercies of Him in whom he trusted, who "has gone before."

ISAAC E. TAYLOR, M. D., *President*.

A. FLINT, Jr., M. D., *Secretary*.

The Nebraska State Medical Society has practically decided that popular advertising is not contrary to its code of ethics. It has refused to censure or discountenance a surgical firm which has largely advertised itself through the secular papers and by means of circulars.—*Philadelphia Medical Times*.

Army Intelligence.

Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from July 14 to August 13, 1877.

SWIFT, E., Lieutenant-Colonel and Assistant Medical Purveyor.—Relieved from duty as Medical Director of this Department, to enable him to comply with S. O. 147, C. S., A. G. O., in his case. G. O. 6, Department of the Gulf, July 18, 1877.

ALDEN, C. H., Major and Surgeon.—Telegraphic instructions of 30th inst. to proceed from Fort Townsend, W. T., to Lewiston, I. T., and report at once to the Department Commander in the field, confirmed. S. O. 90, Department of the Columbia, July 6, 1877.

KINSMAN, J. H., Captain and Assistant Surgeon.—Leave of absence extended one month. S. O. 165, Division of the Atlantic, July 26, 1877.

DE HANNE, J. V., Captain and Assistant Surgeon.—To accompany troops to Fort Clark, Texas, and report to the Commanding Officer, District of the Nueces, for duty. S. O. 125, Department of Texas, July 7, 1877.

MATTHEWS, W. C., Captain and Assistant Surgeon.—To proceed tomorrow to Boise City, Idaho, and join Major Green's command with the least possible delay. S. O. 88, Division of the Pacific and Department of California, July 17, 1877.

DICKSON, J. M., Captain and Assistant Surgeon.—Granted leave of absence for thirty days, on Surgeon's certificate of disability. S. O. 120, Department of the Gulf, July 13, 1877.

ADAIR, G. W., First Lieutenant and Assistant Surgeon.—To report to the Commanding Officer, District of the Rio Grande, Fort Brown, Texas, for duty. S. O. 125, C. S., Department of Texas.

TURRILL, H. S., First Lieutenant and Assistant Surgeon.—Leave of absence extended three months. S. O. 168, A. G. O., August 8, 1877.

HALL, WM. R., First Lieutenant and Assistant Surgeon.—To accompany, until otherwise ordered, the cavalry commanded by Captain Whipple. S. O. 20, Headquarters of the Department of the Columbia in the Field, June 29, 1877.

BUELL, J. W., First Lieutenant and Assistant Surgeon.—Granted leave of absence for one month, with permission to leave limits of the Department. S. O. 137, Department of Texas, July 28, 1877.

Obituary.

PROF. NATHAN R. SMITH, a distinguished surgeon of Baltimore, died July 3d, in his eighty-first year. He was a native of Cornish, New Hampshire. In 1875 he was appointed Professor of Surgery and Anatomy in the University of Vermont, and organized the medical school of that institution. In 1827 he accepted the chair of Surgery in the Medical Department of the University of Maryland, which he filled for many years.

He published a voluminous work on the surgical anatomy of the arteries.

PROF. ALPHEUS B. CROSBY, M. D.—The profession and the public have suffered a great loss in the untimely death of Dr. Crosby, which took place August 10th, in Hanover, New Hampshire, after a brief illness, which resulted in apoplexy. Dr. Crosby was born in Gilmanton, New Hampshire, in 1832, and received his education at Dartmouth College, where he subsequently occupied the chair of Anatomy. He was afterward given the same position in the University of Vermont, and in 1871 he accepted a professorship in Long Island Medical College. He was subsequently appointed Professor of Surgery in Bellevue Hospital Medical College, where his marked abilities as a teacher soon procured for him the popularity of the students. Dr. Crosby was also one of the surgeons to Bellevue Hospital, and had the promise of a brilliant career both as a lecturer and a practitioner.

DR. ABRAM SAGER.—In the death of Dr. Sager, of the University of Michigan, the West loses one of its most eminent physicians and scientists. Dr. Sager was born at Bethlehem, Albany County, N. Y., December 22, 1810. He was graduated from the Polytechnic School at Troy in 1831. Subsequently he attended lectures at the Albany Medical School, and at Castleton, Vt., graduating from the latter institution in 1835. While at Troy he cultivated a taste for the study of botany and zoölogy, which afterward became specialties with him. The Sager Herbarium, now in the University of Michigan, contains twelve hundred species and twelve thousand specimens. As chief in charge of the Botanical and Zoological Departments of the Michigan Survey, he made a large collection of specimens in zoölogy. From 1845 to 1855 Dr. Sager was professor of his specialties in the University of Michigan, besides being Dean of the Medical Faculty, which latter position he held after he had ceased active duties as an instructor. Dr. Sager was a member of many learned societies in this country, and a contributor to our leading medical and scientific journals.—*Medical and Surgical Reporter*.

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Original Communications.

ART. I.—*Should Comparative Anatomy be included in a Medical Course?*¹ By BURT G. WILDER, M. D., Professor of Zoölogy and Comparative Anatomy in Cornell University, and of Physiology in the Medical School of Maine, and Lecturer on Physiology for 1876-'7 in the Medical Department of the University of Michigan.

In his address at the formal opening of Johns Hopkins University, Prof. Huxley used the following language:

"In many medical schools of the present day young men are set down to spend three or four valuable months of the year in the study of zoölogy and comparative anatomy, and botany, and materia medica—that is, a knowledge of drugs and what they come from, and the animals and plants that yield them. If I had power in this matter, I should cut all these subjects out ruthlessly. . . . When the time which a man possesses to become familiar with the structure of the human body is so limited, what earthly business has he to be studying the anatomy of star-fishes, and crabs and lobsters?" (1, 11.)²

To these expressions—which, by the way, should be qual-

¹ Introductory lecture at the Medical School of Maine, February 15, 1877.

² The references are to a list of papers at the close of this article.

ified by the speaker's more carefully-worded discussions of the subject¹—exception is taken by Prof. Harrison Allen, M. D., of the University of Pennsylvania:

"I am a teacher of comparative anatomy in its relations to medicine, of ten years' standing, and, as such, I respectfully protest against the views so conspicuously announced by Prof. Huxley in his recent address at Baltimore. Now, I contend that no good teacher of comparative anatomy to medical students dwells at length upon any such topic as the anatomy of star-fishes and lobsters. He confines himself to the consideration of general principles as they apply to all structure" (2).

As stated in an extended review of his recent work upon "Medical Education in Germany," Prof. Billroth thinks that "zoölogy and comparative anatomy should be taught together; and that the latter, if well taught, is especially adapted for giving breadth of view, and producing the habit of thought best suited to the investigator of Nature." (Review 3,553.)

The foregoing may be taken as fairly representing the present unsettled state of opinion upon this question. The custom of the great majority of medical colleges is presumably in conformity with the general sentiment of the profession. Comparative anatomy is taught in many English schools, but Prof. Huxley would exclude it. It is taught in very few American schools, but Prof. Allen thinks it essential. I do not know to what extent it is taught in German medical schools, but Prof. Billroth has laid especial stress upon its value.

In attempting to decide when such doctors disagree, I can only hope that a somewhat varied and extended connection with medical schools, and with zoölogical teaching, may enable me to consider the whole subject with impartiality. I shall, at any rate, take pleasure in showing that the differences be-

¹ Since this lecture was delivered, Prof. Huxley's lecture on the study of biology has appeared (16). Toward the close occurs the following passage: "To all those who intend to pursue physiology, and especially to those who propose to employ the working years of their lives in the practice of medicine, I say that there is no training so fitted, or which may be of such important service to them, as the thorough discipline in practical biological work, which I have sketched out as being pursued in the laboratory hard by." (See also 18 and 19.)

tween the views of the distinguished anatomists already mentioned are really slight, as compared with the antagonism between them and the opinions current with the profession and the public respecting the requirements of a sound medical education.

The full consideration of the question involves the following points:

I. What is comparative anatomy?

II. What special advantages does it offer to the student of medicine?

III. To what extent should it be pursued?

IV. When should it be pursued?

I. *What is comparative anatomy?*

Etymologically, anatomy designates the study of structure, which must be *dissected*, as opposed to the study of outward form. It may refer to any organism, but is commonly restricted to the animal kingdom. The study of the structure of man is human anatomy, or *anthropotomy*; of the horse, *hippotomy*, etc. In comparative anatomy two or more animals are compared as to their structure. Now since, in some respects unfortunately, the human body has been first thoroughly investigated, and has thence become the standard for comparison, and since the parts of oysters and star-fishes, beetles and lobsters, are not readily identified with those of man, the signification of comparative anatomy is usually restricted to the great branch of the animal kingdom to which man belongs—the *vertebrates*.

There is another kind of comparative anatomy, or rather, it is comparative anatomy pursued in a different way: I mean *embryology*. For, while we hold that a bird is such from the egg, yet at its beginning that egg could not be distinguished from that of a snake or a fish; still later, the embryo could not be distinguished from an embryo lizard or turtle; and even later, the young chicken has webbed feet, like the duck. The tadpole, the young of the frog and toad, has a tail and gills, like some salamanders. The young gar-pike (*Lepidosteus*) has first a *protocercal* tail, like that of *Polypterus*; then the tail becomes *heterocercal*, as in the sharks and sturgeons; by degrees it attains the almost *homocercal* condition

which led some early observers to suppose it similar to the tail of ordinary fishes. (Wilder, 24.) So, too, we hold that the human being is such from its conception. Yet the human ovum is, to our eyes, identical with the ovum of a cat or a dog. For a time the embryo has a short triangular tail, and even after certain parts, as the face, the hands, and the feet, have assumed human characteristics, yet the arms are as long as the legs, and for some time after birth the limbs of the child are semiflexed, as in the monkeys, and it has no more waist than the adult chimpanzee. Hence has arisen the generalization that higher forms, in the course of their development, pass through stages resembling more or less nearly the adult conditions of lower related forms. When, therefore, we trace the successive transformations of a single species, we are, in a limited but most suggestive way, studying comparative anatomy.

II. *What is to be gained by the medical student from the study of comparative anatomy?*

1. It may be regarded as a desirable element of *general culture*, upon the following grounds:

(1.) The contrast between the lower animals and ourselves renders more apparent the advantages of the human form.

(2.) The similarity of our organs and functions to those of animals should teach us consideration and humanity for those which serve us; and, whatever may be the case with those who, brutal by nature, and rendered more so by the horrors of the ordinary dissecting-room, dignify, under the name of science, unnecessary and unproductive tortures, I believe that, as a class, none are more kind and humane than those whose occupation requires them to occasionally take the life of animals.

(3.) The essential identity of the mode of development and the plan of structure of the human body with those of other vertebrates, and the probability that the highest has been gradually evolved from the lowest, should both encourage us to hope for yet further development, mental and physical, in time to come, and fill us with humble adoration of the Power which could, from such unlikely beginnings, create a habitation for the immortal soul of man.

2. It serves as a means of *mental training*. Surely mental training of any kind, and by any method, implies the acquisition or cultivation of the following powers :

- (1.) Accuracy of observation.
- (2.) Thoroughness of comparison.
- (3.) Logic of conclusion.
- (4.) Clearness of definition.
- (5.) Desire for verification.
- (6.) Discrimination between the proved and the merely probable.

(8.) Respect for, yet absolute independence of, authority.

The educational value of the natural history sciences has been, of late years, often insisted on, and by none more emphatically than Prof. Huxley, in the "Lay Sermons" and elsewhere. Indeed, the claim has been more or less fully allowed by nearly all excepting those who, having studied books alone, seem unable to conceive that any good thing can come out of that which hath not been printed, or at least written, by a man.

Life is so short, and his art is so very long, that the physician, like the naturalist, is generally forced to look upon purely linguistic studies as means to an end, as tools for his work. Still, it is to be hoped that few medical men have been obliged to literally adopt the suggestion contained in the following passage :

"Any lawyer or doctor who cannot learn by heart, in a week, all the technical terms and phrases of Latin origin which he encounters in his common professional occupation, has not wits enough for his calling."
—*President Eliot, Inaugural Address.*

I should, indeed, be the last to insist that the study of languages may not likewise subserve the mental training of those who, on other grounds, may select them as their especial field for cultivation ; for I have endeavored to show the striking similarity of linguistic and natural-history studies in respect to the number and importance of exceptions to nearly all general rules, and even to the exceptions themselves (23).

It is the knowledge of exceptions, and the readiness to accept them, which distinguish the mere teacher from him who "professes" to have derived his information from Nature her-

self. The former is apt to be very certain of many things; the latter is absolutely sure of a few things, and has well-defined doubts respecting a large part of what passes in the community for knowledge. "In order to know a few things well, he must be content to remain ignorant of a great deal." Compare, for instance, the modesty, yet precision, with which Dr. Ferrier states his conclusion that the anterior cerebral lobes seem to be the seat of a certain inhibitory power, with the pretentiousness with which traveling phrenologists, "most of whom have never seen a brain," locate all your faculties upon the outside of your skull, and, for a consideration, determine the past, the present, and the future of a human being in a quarter of an hour!

3. Comparative anatomy naturally *leads toward the medical sciences*. Perhaps the converse is even more frequently the case; but there can be no doubt that many who have commenced with the desultory observation of the lower animals have, by degrees, drifted into the systematic study of medicine, either as a mere means of livelihood, or from a natural aptitude not recognized in earlier years.

The foregoing considerations are based upon the assumption that the physician should be primarily a man of culture, intellect, humanity, and religious sentiment. We have now to inquire what are the special advantages which the study of comparative anatomy may confer upon him who undertakes to know the body of man, and to maintain its integrity.

4. *The methods of zoölogical investigation are those which are required in the study of disease*. This is well stated by Billroth, as follows:

"What better preparatory school can the physician have than the study of the natural sciences? The method by which he examines all the parts and all the functions of an animal is the same which he must apply to the investigation of disease. . . . Zoölogy and comparative anatomy should be taught together; and the latter especially, if well taught, is one of the most valuable subjects for giving breadth of view, and producing the habit of thought best suited to the investigation of Nature" (3, p. 553).

Nor need we, with Dr. Cotting (10), be fully convinced that "disease is a part of the plan of creation," to recognize

in its phenomena an orderly sequence and correlation which entitle it to be regarded as a branch, though a distorted one, of the great natural-history tree.

Comparative anatomy furnishes many illustrations of the saying, "Appearances are deceitful," and so teaches us to look below the surface. Linnæus supposed the whale to be a fish, not knowing that it had lungs, that its blood is warm, and that its young are nourished with milk. So, the flying-bat may readily be mistaken for a bird. Nor are there any external peculiarities of the Australian quadrupeds which would lead us, at first sight, to infer the existence of the pouch in which the young are carried, and the smallness of the corpus callosum.

The second pair of lobes of the ordinary fish-brain have usually been called hemispheres, implying an identity of structure with the hemispheres of reptiles. Yet both comparative anatomy and development teach that the essential feature of a hemisphere is its cavity or *ventricle*, and no ventricle has ever been found in the so-called hemisphere of the teleost or ganoid brain. Müller first showed the solidity of these lobes in a figure of the cross-section of the brain of *Polypterus*.

So, in the diagnosis of a disease, the physician finds that its real nature is not always indicated by the more prominent symptoms; and it is not improbable that the early medical training of Owen gave especial significance, in his own mind, to the following aphorism: "The prominent appearances which first catch the eye are not always the best guides to the true affinities of an animal. It is as if truth were rather whispered than spoken by Nature."

It may be said that the advantages above mentioned may be derived from the systematic pursuit of any branch of natural history, or from the anatomy of insects or other non-vertebrated animals. But there are additional and very considerable reasons why the medical student should select the comparative anatomy of vertebrates. These reasons may be variously stated, but they all depend upon the fact that man, as to his body, is a vertebrate, and that the regions, organs, and tissues of the human body have essentially the same structure, the same relative position, and the same mode of development,

as those of fishes, frogs, turtles, birds, quadrupeds, and monkeys; in a word, because the *human organs are homologous with the organs of other vertebrates*.

5. From the above, it follows that comparative anatomy enables us to make *instructive comparisons*. It was said by Dr. Gould (himself not only an able physician but a distinguished naturalist, and author, with Agassiz, of "The Principles of Zoology"), that "the anatomical structure is only to be fully and understandingly acquired by comparison of the structure of one animal with that of another" (6, p. 8). But this comparison must be made within certain limits. It may be interesting to contrast the arm of man with the tentacle of a cuttle-fish, but, excepting that both are living, either might almost as instructively be compared with an arm of the sea. So, the wing of a bird may be contrasted with the wing of a butterfly, but their structural similarity is hardly greater than that between either and the wing of a house. These are only analogies, more or less remote; while, in spite of their outward dissimilarity, the arm of man, the wing of a bird, the front-leg of a cat, and the flipper of a seal, are all homologous; and even the wide-spread wing of a bat is, at its first appearance, a little flattened pad, undistinguishable from the paw of the embryo kitten or pig (25). There is, in these cases, essential resemblance, with outward difference in adaptation to the needs of each species; and the collocation of the two is the more instructive, just as the relations of two friends, or of a married pair, are more enjoyable and productive when their real affinity is hidden from the world by a diversity of temperament, capacity, or occupation. Perhaps no better illustration of this "unity in variety" could be given than the close and long-enduring mutual affection and esteem which united the distinguished mathematician of Harvard University with his colleague, the late Prof. Agassiz—pure zoölogy and pure mathematics hand in hand.

Aside, however, from the instructiveness of comparisons between man and the lower animals, there are certain practical reasons for dissecting the latter before the former. These may be combined by saying that:

6. *Comparative anatomy forms a convenient introduc-*

tion to human anatomy. The accomplished human anatomist must have made the following acquirements :

Firstly. Skill in manipulation, including not only dissecting, but injecting, and microscopic examination.

It is probably not too much to say, that the student's first dissections rarely do credit to himself or to the long-suffering demonstrator. Now, a human subject is costly, unwieldy, and, before it is disposed of, apt to answer more or less accurately to Mr. Mantalini's prophetic description of what he would be after being drowned—"a demmed damp, unpleasant body;" yet, upon it the tyro must begin, or do nothing in practical anatomy. In no other trade or profession is the most valuable material placed in the hands of the beginner; and it is only one of the anomalies of medical education, apparently resulting from an unwillingness to admit that this mysterious profession can have anything in common with other human occupations, that all kinds of anatomical manipulation are not learned by long practice upon cats and dogs and rabbits, which may be had at little cost, which are easy to handle, and at very slight expense may be preserved for an indefinite period.

Why should not the anatomist take a lesson herein from the physiologist? Much has been learned from accident and disease, and some simple experiments may be performed upon the human body; but how much would there be left of modern physiological science if all that has been attained by experimentation upon animals were suddenly to be erased from record?¹

Secondly. The anatomist must become familiar with the *technical names of parts*. It is usually not difficult to have access to a human skeleton, and the bones should be learned before the student enters the dissecting-room; but the skeleton of a common quadruped will serve a very good purpose as a beginning. The same is to be said of the principal muscles, vessels, and nerves, so that they can be identified by means of

¹ Recent legislation has left England in the anomalous position of placing considerable restrictions upon the acquisition of precise physiological knowledge by trained experimenters, while an ignorant brute may, at the expense of a few shillings, maltreat his wife and children.

the works on human anatomy; minor points can be overlooked in the earlier dissections. Finally, the viscera, which are usually disorganized before they are reached in the dissecting-room, may be had fresh in a newly-killed quadruped, and may then be examined histologically, as well as in respect to their visible structure.

The general structure of the heart can be learned just as well from that of a sheep, which costs a few cents, and is perfectly fresh, as from that of a human subject, which is less easy to obtain, may be full of injection, probably has an "ancient and fish-like smell," and, not unfrequently, presents certain pathological conditions which are worse than useless to the beginner in anatomy.

Thirdly. The student must learn the *relations* of parts to each other, to the surface, and to the surroundings. These relations are essentially the same in all vertebrates; but, in order to compare the parts of man with those of a cat, the latter must be placed erect, or, which is more convenient, the human body must be reduced to the horizontal position. It is also necessary to note that the so-called "knee" of the horse is really the *wrist*, and that the true knee is near the trunk; while the heel, with most quadrupeds, is greatly elevated. Keeping these, and some minor differences, in mind, the student is soon enabled to identify the muscles, vessels, and larger nerves of a quadruped, by means of the figures and descriptions in his "Gray" or "Quain."

At a later period, a monkey will be very useful as presenting more nearly the human arrangement of parts; and, although medical students are apt to think such a tiny subject beneath their notice, a child, or foetus at term, answers a most useful purpose.

Not only do such materials as these cost less themselves, they also involve much less expensive accessory arrangements.

7. *In some lower vertebrates the tissues are coarser and more easily examined.* This is especially the case with the *Amphibia*, and the late Prof. Wyman used to say that "frogs seem to have been made for anatomists." The frog is an almost typical vertebrate, occupying a position between the fishes below and the air-breathing groups above. It is easy

to breed, to keep, and to kill. Its very skin is as if only "basted on," so as to be readily stripped off. The muscles are distinct. The *membrana tympani* is at the level of the head. More than this, the red-blood corpuscles are nearly three times as large as those of man. The white corpuscles are large, and their amœboid movements very active. Ciliated cells can readily be scraped from the roof of the mouth, and the zoösperms are not only easily obtained, but also larger than in man. In some respects even the frog is excelled by a tailed Batrachian, the *Menobranchus* or *Necturus* of New York and westward, whose red corpuscles are more than eight times as large as those of man, and whose zoösperms are more than ten times the length of the human.

8. *Comparative anatomy enables us to understand certain human structures more readily.* So far as I know, this use of comparative anatomy has never been distinctly presented. It depends upon the fact that, with certain of the lower vertebrates, organs which are very complex in man present a simpler structure and arrangement.

To some this statement may appear either as self-evident, or as, at any rate, requiring no qualification. But, in fact, the generalization is far from being universally correct. For instance, the deltoid muscle, which in man is a single triangular mass, in cats and dogs forms three quite distinct muscles, which have received as many names; the same is the case with the *trapezius*; and all quadrupeds have, just beneath the skin, a sheet of muscle, the *panniculus carnosus*, which is represented in the human body only by the *platysma myoides*, the muscles of the ear and of the face. So, too, the bones which support the upper incisor teeth are separable from the rest of the jaw with quadrupeds, and are called the premaxillaries, or intermaxillaries. The stomach of a sheep or a porpoise is much more complex than that of man. The heart of an alligator presents peculiar characters. Finally, beside the skull of a cod, the human skull is simplicity itself.

The cod is, in fact, a typical member of a very large group of vertebrates, the Teleosts, or osseous fishes, which are highly *specialized* in adaptation to a certain mode of existence; and, as a rule, specialized groups should not be brought before the

notice of the medical student. Whatever may have been its value in pure comparative anatomy, I cannot but feel that the anatomical side of medical education twenty years ago suffered a serious drawback from the supposed necessity of understanding the skull and skeleton of the fish before studying those of man.

But the so-called "generalized" groups of vertebrates frequently illustrate in a very simple way the more complex conditions of the human body which we wish to understand; and, in first making ourselves familiar with them, we act in accordance with the following aphorism:

"In all departments of investigation it is right to commence with the study of that which is common, simple, and regular, and thence to proceed to inquire respecting that which is unusual and irregular" (Bucknill and Tuke, 22).

For instance, when the student is told that man, like other vertebrates, consists of two parallel cavities, a dorsal or neural, containing the cerebro-spinal axis, and a ventral or hæmal, containing the nutritive and reproductive viscera, and that the alimentary canal is essentially a tube from one end of the trunk to the other, he may accept the statements upon authority; but if you place in his hands a lamprey-eel, and tell him to make a transverse section at the middle of its length, he may then, at a glance, satisfy himself of the correctness of your description of the arrangement of organs which is characteristic of the vertebrate subkingdom.

Descriptive anatomy teaches us that there is one heart, and that it lies between two lungs, the right and the left; also that the vessels enter the lungs and come out of them. From a physiological point of view the lungs are a single thin walled diverticulum of the alimentary canal, *over* the walls of which the pulmonary vessels ramify; and that this single lung lies between the two hearts, the right and the left.

The student finds it hard to see it in that light—the light of human anatomy. But show him the heart of a manatee or a dugong—still better, the admirable Auzoux model thereof—and he sees that there the two ventricles are almost wholly separated.

Now, as the blood comes to the lungs from the right ven-

tricle, and returns from them to the left, it follows that the lungs are, physiologically, between the right and the left hearts. The lungs of a frog are nearly simple sacs hanging from the anterior aspect of the throat; and, at their first appearance even in man, they are a little bilobed pouch or diverticulum from the alimentary canal.

How the student dreads an examination upon the cranial nerves! and how is the confusion worse confounded by the double nomenclature of Sömmering and of Willis! He takes an almost revengeful delight in being assured that neither system is correct, for the auditory (VIII.) and optic (II.) are nerves of special sense, the latter, at any rate, being direct outgrowths from the brain; and the olfactory (I.) is not a nerve at all, but a lobe of the brain, quite large in quadrupeds, and containing an obvious prolongation of the lateral ventricle; in the hag-fishes and lamprey-eels it is larger than the hemisphere itself; while in some sharks the olfactory lobes seem to be distinctly formed before the true hemispheres, as if with these voracious fishes the scenting and recognition of food were more urgently required than any subsequent reflections respecting the mode of its acquisition, or the dangers attendant thereupon.

Nine pairs of cranial nerves remain. If the student has condescended to throw light upon his path by taking the initial letters of *anterior*, *motor*, *posterior*, *sensory*, and prefixing *L.* thereto, he will look for motor nerves upon the ventral or anterior aspect of the medulla, and for sensory upon its posterior aspect. But when he is told that in frogs there are only five pairs, and that in some others there are only three, he begins to realize that the *motor communis* (III.), the *trochlearis* (IV.) (miscalled *patheticus*), the *abducens* (VI.), and *facial* (VII.), with the smaller root of the *trifacial* (V.), are really dismemberments of the motor roots of a great nerve, of which the rest of the *trifacial*, with its ganglion, forms the sensory root; that the two, therefore, constitute a single modified nerve like those of the spine. After this it is not difficult to suppose that the spinal accessory (XI.) and the *vagus* (X.) form a second pair, and that the hypoglossal (XII.) and the glossopharyngeal (IX.) constitute a third.

This is the arrangement proposed by Dalton, and it is at least convenient, and easy to remember. But it can hardly be considered conclusive, because with frogs the hypoglossal is a regular cervical nerve with motor and sensory roots, which leaves the glossopharyngeal to unite with the vagus.

It is probable that, in course of time, these relations will be more fully understood, and that the present artificial nomenclature will be discarded.

Even more appalling than the cranial nerves is the brain itself. Men have been graduated without being able to remember the difference between the *corpus callosum* and the *corpus striatum*; and probably few can state with certainty, off-hand, whether the optic lobes are in front of the thalami or behind them. It is easy to see that the medulla is a modified enlargement of the cord, but the exact and personal knowledge of the average student rarely extends beyond the *pons Varolii*, which has thus become a veritable *pons asinorum*.

No doubt part of the difficulty arises from the peculiar nomenclature which has been left to us by our anatomical forefathers. I apprehend that *peculiar* will be admitted to be a very mild characterization of the system according to which a narrow passage about an inch in length became known by two such appellations as "aqueduct of Sylvius" and "iter a tertio ad ventriculum quartum;" especially when neither of them expresses the fact that this passage is the contracted representative of the cavity or ventricle of the optic lobes, a primary subdivision of the brain.

But whatever difficulties of nomenclature the student may have to contend with, I believe the failure of most medical students to gain a clear conception of the arrangement of brain-parts is even more largely due to a faulty system of teaching and of study.

In the first place, since a human brain is not easy to get at all, and almost impossible to obtain perfectly fresh, there are reasons of convenience and economy for examining the brain of some common animal. In the second place, the human brain is so large as to be easily torn by its own weight, or, if hardened, to require much fluid, and time, and attention.

But more than either of these considerations is that of the *complexity* of the human brain, and the disproportionate size of certain parts by which others equally essential are concealed. I shall give you, hereafter, the description of the typical structure and mode of development of the brain which will be most useful to us from a physiological point of view, and will now refer only to the *hemispheres*. These, with man, are so large as to cover all the other portions when the brain is seen from above, and their numerous convolutions have not yet been reduced to a perfectly satisfactory pattern. With cats and dogs and monkeys, the hemispheres are relatively smaller, and their fissures are less numerous. With some of the lower monkeys, as with rabbits, the hemispheres are almost smooth. With moles, as with reptiles, they do not wholly cover the optic lobes. Finally, in frogs they are simple elongated masses lying side by side, but wholly separate from each other, between the olfactory lobes and the thalami, and hardly larger than the optic lobes.

In short, the hemispheres are here reduced to their proper morphological condition as lobes of the brain. Yet their cavities are, as in man, the *lateral ventricles*.

By availing ourselves of the other kind of comparative anatomy, namely embryology, we may, in a series of foetal pigs, readily procurable from any slaughter-house, not only trace the hemispheres back to their smaller and smoother condition, but also at last, or rather at the first, to the state of minute hollow buds or protrusions from the anterior vesicle of the embryo brain, which itself becomes the thalami. Strange to say, the gigantic hemispheres of man are not only the homologues of the insignificant second lobes of the frog, but, in the earliest condition of the brain, they have no existence at all, and are merely secondary formations from the thalami, which they afterward outgrow, as when a diminutive father is overtopped by his stalwart son.

Now, this is not simply curious, and, I trust, interesting; it is *valuable* to the student who would master the arrangement of parts of that organic labyrinth, the human brain. Let him learn the names of the lobes and their ventricles in the frog from behind forward, and I can assure him, from experience,

that he will afterward have little difficulty in understanding the other and less essential parts and complications by which the brains of higher forms differ from those of lower.

So greatly, indeed, does this comparative-anatomy method facilitate the study of the brain, that I can only account for Prof. Huxley's non-reference to it in his address, and upon other occasions, by the fact that to him, more than to any other, is due the credit for placing (17) the labors of embryologists and comparative anatomists in an intelligible English dress.

III. *To what extent should the study of comparative anatomy be pursued by the medical student?*

Assuming, first, that no one can know too much, and, secondly, that the average student is apt to learn no zoölogy at all, we should endeavor to define the amount of acquaintance which shall be at the same time most useful and most easily acquired.

The student should have a good general knowledge of the animal kingdom, including the names and leading characteristics, external and internal, of the great primary branches. Neither the Radiates (star-fishes and sea-urchins) nor the Mollusks and Molluscoids (clams, snails, and cuttle-fishes) need long occupy his attention. The same is to be said of the Crustacea (crabs and lobsters) and worms, though certain kinds of worms have a practical importance. He should know the difference between the spiders and the true insects, and what kinds are liable to injure by jaws or sting.

But among the vertebrates his knowledge should be much more extensive. He should know that a salamander and a lizard are members of two separate classes, the Amphibia and Reptiles; and that among the so-called "fishes" are forms differing from one another as widely as do turtles from birds. He should know that a bat is not a bird, not only from having hair in place of feathers, but also because the young are nourished with milk; it has two occipital condyles; its brain possesses a *pons Varolii*, a *fornix*, and a *corpus callosum*; and its red corpuseles are round and non-nucleated. But he should also know that in one group of mammals, the camels and llamas, the red corpuseles are oval, as in birds and reptiles.

But while the student should learn, at any rate from lectures, the names and distinguishing features of the vertebrate classes, so as to appreciate the bearing of any generalization that may be presented to him, and while he would certainly be profited by the dissection of a lamprey, a shark, a sturgeon, and a perch, as types of certain groups, as he would by the examination of a reptile or a bird, yet he should bear in mind that these are of scientific rather than practical value. He should confine himself mainly to such forms and such organs as may facilitate the study of human anatomy and physiology in respect to convenience, intelligibility, or economy of time or expense; and with these forms his acquaintance can hardly be too practical or extensive.

Among all these forms the *frog* is the most useful, especially as a beginning. Indeed, had Prof. Huxley never done anything else in aid of the diffusion of biological knowledge, we should owe him gratitude and honor for the concise summary of the structure of that animal which was prepared under his direction in the "Elementary Biology."

The cat, dog, and rabbit may be dissected by a human anatomy; but something has been done toward furnishing manuals for the examination of these quadrupeds. A descriptive anatomy of the rabbit has been published in German by Krause (20).

The bones, muscles, and ligaments of the cat have been described and elegantly figured by Strauss-Durckheim; but the text is in French, the descriptions are too long for practical purposes, the nomenclature is artificial, and the plates are inconveniently large. Reduced photolithographic copies of the outline plates, with an explanatory text by Mr. H. S. Williams, have been published by Putnam's Sons, of New York.

Directions for examination of the rabbit or dog are given in Foster and Langley's admirable "Practical Physiology." Finally, similar directions are given in Morrell's little work (21) for dissections of the heart, brain, and head of the sheep, and the ox's eye.

Now, these are average mammals; and the frog is an average vertebrate, midway between the higher and the lower.

But, upon the same principle as that which leads the teacher to contrast the two ends of his class, the genius and the dunce, it may be worth while to glance from man to the opposite extreme of the vertebrate series. The lancelet is worth examination, if only to convince ourselves that the same essential arrangement of organs may exist in the little fish three inches long and the whale of sixty feet. In fact, during my lectures I shall so frequently employ the *Amphioxus* for odious comparisons with man, that I fear some of you may be inclined to spell it with an initial "D."

If the reasons for recommending the dissection of the above-named forms are sound, they are equally cogent for the exclusion of all peculiar and "specialized" groups. Hence, neither birds nor ordinary fishes (Teleosts) should be especially studied by the medical student. They present other and unusual combinations, and tend to confuse, rather than simplify, the ideas which may have been derived from more generalized forms.

In the letter already referred to (2) Prof. Allen has suggested some other ways in which a knowledge of comparative anatomy and zoölogy may be of use to the medical student:

"An exact knowledge of the venomous animals—of internal and external parasites—the relations of food-animals to one another and to man, are all of great importance to the physician."

I think this will be admitted by all; but the real question is, How wide and how general should be the physician's knowledge upon these points? He should certainly know very thoroughly the structure and transformations of the *Trichina* and the tape-worm, to the extent, for instance, described and figured in Dalton's "Physiology." But, in order to learn their relations to the other members of the immense class of worms, the student would have to neglect something else; and very likely that something else would be the *treatment* of the disorders produced by these parasites.

So, too, he should know the names and habits of venomous insects and serpents, and be aware that the bite of a jumping-spider (*Salticus*) is more apt to do harm than that of its larger but less vigorous relative, the garden-spider (*Epeira*);

also, that the so-called water-adder of the Middle States has no poison-fangs or glands, and that its bite is therefore not apt to cause serious injury.

But, to learn these things, he need not dissect a spider or a snake, or even hear the whole of their structure described in a lecture. Much less need he know the precise zoölogical relations of these to the other articulates or vertebrates. He will, of course, be none the worse for such, or any other, information; but, as a medical man, he should keep in mind that his business is to learn, and *remember*, how the venom acts upon the system, and what may be done to counteract its effects.

I say *remember*, for to have known a fact is a very different thing from knowing it now and always. We all learn a great many things, and some of them may come back when wanted; but some others should be ever present—should form a part of our mental constitution, ready for use at any time.

Prof. Allen further says:

“If the doctrine of evolution has any practical value, it must lie in the application that the medical philosopher may make of it in explaining the significance of variations and malformations in the anatomy of man.”

Certainly this is a very fascinating subject, and of great scientific interest. But, for practical purposes, is it not enough that the student be told that many muscles, vessels, and nerves are liable to variation, and that some of these variations closely resemble the normal condition of the parts in monkeys and other animals? At any rate, while personally interested in this very matter, and while advocating the incorporation of a certain amount of instruction upon such topics into a complete *preliminary* medical education, I should deplore the devotion to them of any of the lectures of the regular medical course.

Upon this point the following remarks have lately been made by Prof. Cleland, of Galway, himself an eminent comparative anatomist, as well as teacher of human anatomy in a medical school:

“There can be no doubt that a great and curious influence has been exercised on morphology by the rise of the doctrine of the origin of species by natural selection. Attention has thereby been directed strongly for a number of years to varieties; and probably it is to this doctrine that we

owe the larger number of observations made on variations of muscles, nerves, and other structures. Particularly elaborate have been the records of muscular variations, very praiseworthy, interesting to the recorders, very dry to most other people, and hitherto, so far as I know, barren enough of any general conclusions. So much the more credit is due to those who have worked steadily, in faith that beauty will emerge to gild their results some day" (13).

I regret that upon this matter my views do not altogether accord with those of my friend Prof. Allen. His position as teacher of comparative anatomy in a large medical school must afford far better opportunities than mine have been for observing the degree in which such instruction is useful to the average student. But my own experience and observation of others in several schools compel me to the conclusion that such instruction should either be received before entering the school, or, after entrance, rigidly restricted within very narrow limits, according to the practical advantages derivable therefrom.

This, as I understand his address in connection with his previous utterances upon the subject, is essentially the opinion of Prof. Huxley. Billroth's recommendations look in the same direction. And it gives me pleasure to quote, with his permission, from a personal letter from Prof. Allen, that he thinks "the medical student should have a general knowledge of biology before beginning his studies."

Perhaps I cannot better illustrate the extent to which, as a comparative anatomist, I believe the study of comparative anatomy should be limited in a medical course, than by a quotation from one of the oldest and most experienced as well as the wittiest of anatomical teachers.

He said, ten years ago :

"Is not the question why our young men and women so often break down, and how they may be kept from breaking down, far more important for physicians to settle, than whether there is one cranial vertebra, or four, or none?"

"But I have a taste for the homologies. I want to go deeply into the subject of embryology. I want to analyze the protonihilates precipitated from pigeon's-milk by the action of the lunar spectrum! Shall I not follow my star? Shall I not obey my instinct? Shall I not give myself to the lofty pursuits of science for its own sake?"

"Certainly you may, if you like; but take down your sign, or never put

it up. That is the way Dr. Owen and Dr. Huxley, Dr. Agassiz and Dr. Jeffries Wyman, Dr. Gray and Dr. Charles T. Jackson, settled the difficulty. We all admire the achievements of this band of distinguished doctors who do not practise. But we say of their work, and of all pure science, as the French officer said of the charge of the six hundred at Bala-klava: 'C'est magnifique, mais ce n'est pas la guerre!'—it is very splendid, but it is not a practising doctor's business. His patient has a right to the cream of his life, and not merely to the thin milk that is left after Science has skimmed it off. The best a physician has is never too good for his patient." (Holmes, 5, 29.)

The following is likewise to the point under consideration:

"'I suppose I must go and earn this —— guinea,' said a medical man, who was sent for while he was dissecting an animal. I should not have cared to be his patient. His dissection would have done me no good, and his thoughts would be too much upon it. I want a whole man for my doctor, not a half one. I would have sent for a humbler practitioner, who would have given himself entirely to me, and told the other—who was no less a man than John Hunter—to go on and finish the dissection of his tiger. (Holmes, 5, 25.)

"Medicine is my wife, and Science is my mistress," said Dr. Rush. And Dr. Holmes adds, "I do not think that the breach of the seventh commandment can be shown to have been of advantage to the legitimate owner of his affections."

Let not the wit at which we smile prevent our reflection upon the solemn truth of this commentary. To the honorable physician science should be a kindly, helpful friend, but nothing more—unless, that is, he openly proclaims a separation from his profession.

IV. *When should this instruction be given?* It is necessary to repeat, that our object is to make competent *doctors*, not thorough comparative anatomists; also that, as to his body, man is a very peculiar and highly specialized mammalian vertebrate. In fact, so far from being in any respect a type of either vertebrates or mammals, he is, morphologically speaking, a monster.

While, therefore, the final end of medical education is a knowledge of the structure and functions of the human body, all the considerations hitherto advanced indicate the desirability of *preceding human anatomy by comparative*.

True, the custom is almost always the reverse, as has been stated in a late introductory lecture. "First, the student be-

comes acquainted with the structure and functions of the human subject, the subject of his future practice. Secondly, knowing one animal well, he is in the best position to proceed to the study of others, and so to comparative anatomy and physiology."

Fully admitting the truth of the clause, "Knowing one animal well, he is in the best position to proceed to the study of others," I hold that the general idea of the passage quoted is just contrary to what should be entertained respecting medical education. For the real object of the student is the anatomy of *man*; and for him to study human anatomy before comparative anatomy, is, in common language, to "place the cart before the horse."

But if, before undertaking the study of the human body, it is necessary to dissect an *Amphioxus*, a frog, and a cat; and if the examination of the human heart is to be preceded by dissection of the heart of a sheep; and if the human brain cannot be readily understood without previous study of the brains of frog, rabbit, cat, and monkey; and if, moreover, the performance of this preliminary work involves familiarity with the use of the microscope as well as of ordinary dissecting-instruments, it may well be asked: 1. When is time to be found for it all? and 2. Where are there offered any opportunities for its accomplishment?

In the United States the chief prerequisite to graduation in medicine is attendance upon two full courses of lectures upon the fundamental branches. These courses vary in length from four to nine months; the more usual period is between five and six months. We are not here concerned directly with the facts that in the profession, and before the law, forty lectures upon physiology, for instance, are accepted as equivalent to eighty lectures in another institution; and that, as stated in an editorial in the *Boston Medical and Surgical Journal* for April 27, 1876, p. 491, "at the ———— Medical School any enterprising young man may, by a series of ingenious devices, obtain, at a merely nominal price, a medical diploma within the short space of nine months." What I wish here to insist upon is, that the two medical sessions are *already too full*, and that the introduction of comparative anatomy

would require either the omission of some subjects, or the reduction of the time now devoted to them.

Probably there is no respectable graduate, of ten years' standing, from any American medical college, who would not, if called upon to express an opinion wholly irrespective of its effect upon public sentiment, or upon the school with which he happens to be connected, affirm that the present term of instruction is too brief. This idea is the burden of nearly every impartial discussion of medical education; it has been forcibly expressed by Gould (6), by Reeve and McCook (7), by Wood, and others. The last announcement of the Medical Department of the University of Michigan contains the following significant paragraph:

"The time usually spent in American medical colleges—always too short—is now entirely inadequate to that full, thorough, and repeated presentation of the subjects required in a proper medical education."

Finally, in a speech upon scientific education, Prof. Huxley has sharply questioned the sufficiency of the four or five years' course in English medical schools, holding that, "in nine cases out of ten, the first year is spent in learning how to learn" (4). It is obvious that, if this criticism is merited, it applies with greater force to the much shorter courses in our own country.

It may be suggested, by some who admit the value of comparative anatomy to the medical student, that a few hours might be diverted from human anatomy to the exposition of some animal structures. But this does not meet the requirements. The necessary information and training, especially the latter, cannot be gained in a few lectures, or even from lectures at all! What the student needs is an intimate, personal, and practical acquaintance with the organization of certain animals, so that he may thereby more readily and fully comprehend the human body, and profit by didactic instruction in human anatomy.

In the second place, even were the professors of anatomy willing to yield a portion of their time (and it is obvious that any such change does not commend itself to a professor under the usual system of our schools), I should urge that the

time so gained be given, not to comparative anatomy, but to physiology, and especially hygiene.

Now, I cannot claim to be wholly exempt from that form of human weakness which, in a council of war for the defense of a town, induced a tanner to declare that "for the building of fortifications there is nothing like leather;" and I hasten to escape the imputation of interested motives by the solemn affirmation that, although the words of physiology are on my lips, my heart belongs to comparative anatomy.

In passing, I may here express the opinion that the progress of students would be facilitated if the anatomical course should commence with the viscera instead of with the bones and muscles, following thus the order naturally adopted in the physiological course.

Since it is doubtful whether any additional studies can be embraced within the regular medical courses; and since, for many, if not most purposes, the comparative anatomy should precede the human anatomy, the question arises whether its study may not profitably be pursued before entrance into the schools.

It is now required, in the United States, that at least three years¹ be spent "in the study of medicine," under the direction of some regular practitioner or graduate.

If common report be true, the certificates respecting this period of study are sometimes equally trustworthy with those for "good moral character." The schools, however, rarely "go behind the returns," in order to ascertain just how this time has been spent.

At best, the student has "read anatomy," studied "the bones," and accompanied his preceptor upon his visits. Perhaps the first two occupations are not altogether unprofitable, though they are apt to be carried on in a leisurely and unsystematic way. But as to the last, I venture to express the belief that it represents time worse than wasted; that it is positively injurious, as tending to give the youth confidence in the powers of his *art*, before he has learned the *science* accord-

¹ It is stated that five years are required in Russia and Austria, and four in Germany. Billroth thinks five should be the minimum period of medical education (3, 580).

ing to which the art may be safely practised. Certain rules and formulæ crystallize into a therapeutic bed of Procrustes, from which his patients vary at their deadly peril. In no profession is a "rule of thumb" so totally out of place.

If, as is now generally admitted, diseases are perversions of normal functions; and if the investigation of any subject should proceed from that which is simple and regular to that which is more complex, then, upon the same ground that the study of the human brain should begin with that of the frog, the study of disease should be preceded by the prolonged observation of normal physiological phenomena. The study of medicine should commence without the mention of medicine or of disease.

The graded course of the Harvard Medical School¹ includes in the first year only anatomy, physiology, and chemistry; and a recent editorial in the *Medical Times and Gazette* (October 7, 1876, p. 418) urges that, partly for lack of proper preparation, neither the first nor second year students ought to visit the hospital wards. See also Gould (6, 8).

Why, then, should not the student spend some portion of his pupilage, not occupied in the exercises of the schools, *in biological work*? His preceptor may not be especially prepared to guide his labors, but this need not now be a serious impediment. Within the past two years there have appeared two little books, Huxley and Martin's "Elementary Biology" and Foster and Langley's "Practical Physiology." They are small and inexpensive. The medical student may be obliged to omit some portions of the biology, but together they form the most advantageous introductions to both medical and natural history studies which have ever been published.

Most of the work described in these two volumes may be accomplished by the student alone, if he be reasonably earnest and intelligent. But why, in every large town, should there not be formed a laboratory under the direction of one or more practitioners, wherein such work might be done by several students, and with the advantages of better material, micro-

¹ Graded courses have been more or less fully adopted in the Universities of Michigan and Pennsylvania and the Medical School of Maine.

scopes, and other apparatus, than could be afforded by single individuals? A year so spent, and in the study of a certain amount of chemistry, anatomy, physiology, and hygiene, would be worth far more than the same time devoted to all the medical sciences together, to the compounding of prescriptions, or to the service of a practitioner.

Particularly advantageous would it be to establish such a laboratory in connection with a medical school, or with a university possessing a medical department.

As an indication of the extent to which such instruction is desired, I may give some statistics respecting the anatomical laboratory of Cornell University, premising that my own inclinations are toward pure zoölogy rather than physiology, and that there is no medical department connected with the university.¹

During the eight and a half years since the opening of Cornell University, nearly one hundred students have worked in my laboratory. Of these, about one-third were preparing to become teachers, or professional naturalists; the remaining sixty-seven have since entered medical schools, or are intending to do so. There is abundant evidence that such students are much better able to profit by their later medical training, and that, upon graduation, they more readily obtain positions of honor or profit in their profession.

Doubtless the same is true of students who have been thus prepared to study medicine in the laboratories of other institutions.

I am not aware, however, that the need of a preliminary education especially adapted to the medical student has elsewhere been so fully recognized as to lead to the arrangement of a separate curriculum, like the Natural History course in Cornell University.

The following summary of this course shows that, while studies for general culture are not excluded, four-fifths of the

¹ It is to be hoped that no proposition to establish a new medical school will be entertained, unless it include the assurance of an endowment such as may warrant an elevation of the standards for admission and graduation far above the present general level.

time is devoted to the sciences and to laboratory practice, including drawing.¹

SUMMARY OF THE COURSE IN NATURAL HISTORY AT THE CORNELL UNIVERSITY.

REQUIREMENTS FOR ADMISSION.

1. English grammar.
2. Arithmetic.
3. Algebra through quadratics.
4. Plane geometry and trigonometry.
5. Latin (Allen's "Reader").
6. Greek (elementary).
7. Physiology (elementary).
8. Elementary French or German.

Four Years' Course.

| | Exercises. | Actual hours. |
|---|------------|---------------|
| General culture..... | 552 | |
| Physical sciences (including geology)..... | 662 | |
| Botany..... | 282 | |
| Zoölogy..... | 502 | |
| Total..... | 1998 | |
| Laboratory practice, including drawing ² | 546 | 1365 |

Studies for general Culture.

| | Exercises. |
|------------------------------------|------------|
| French and German..... | 352 |
| English language and rhetoric..... | 140 |
| History of science..... | 24 |
| Free-hand drawing..... | 36 |
| Total..... | 552 |

¹ It is to be hoped that, ere long, children shall learn to draw before they write; and that the practical value of the ability to make an outline diagram will be more fully recognized by not only naturalists but physicians, if only as an *auxiliary to practice*. The patient desires to learn where his trouble lies, and in what it consists. He is too ill, perhaps, or too anxious, to understand the language of the physician, even though the latter be clear in his idea and his expression. But a simple drawing may be intelligible to almost any one; and he who can make the drawing is understood, and, consequently, appreciated.

² An exercise requires two and a half hours of actual work.

Physical Sciences.

| | |
|---|-----|
| Physics..... | 260 |
| Chemistry, lectures..... | 60 |
| " laboratory practice..... | 60 |
| Geology and paleontology, lectures..... | 96 |
| " " " laboratory practice..... | 186 |
| Total..... | 662 |

Biology.

| | |
|---|-----|
| Botany, general lectures..... | 86 |
| " lectures, and laboratory practice..... | 122 |
| " laboratory practice on special groups..... | 74 |
| Total botany..... | 282 |
| Physiology and hygiene, lectures..... | 42 |
| " laboratory practice..... | 60 |
| Zoölogy, lectures..... | 30 |
| " laboratory practice..... | 80 |
| Comparative anatomy, special lectures..... | 20 |
| Anatomy and physiology of domestic animals ¹ | 60 |
| Medicine and surgery of domestic animals..... | 100 |
| Preparation of thesis, and laboratory practice in anatomy and physiology... | 110 |
| Total zoölogy..... | 502 |

Doubtless the foregoing course is open to criticism; and I hope that a place may be found for instruction in logic, the omission of which from the ordinary medical curriculum has, as pointed out by Prof. Dunster (8, 10), led to the most unwarrantable conclusions respecting the utility of a given method of treatment.

In speaking (1, 12) of the advantages of preliminary training in botany, chemistry, and physiology, Prof. Huxley says, "I believe we may consider it as practically doubling the time of professional study."

Sooner or later the demand will be made for the allowance of time so spent as equivalent to part of the three years of study. While it may be well to accede to the demand for the present, and to a certain extent, there can be no doubt that the best interests of the profession and the public will be subserved by gradually requiring of all students an extended

¹ For this, and the two following studies, the student intending to become a *naturalist* may substitute work in botany or geology.

preliminary education in all branches which are directly subsidiary to the medical sciences.

It is to be regretted that the Articles of Confederation proposed to be conformed to by the American Medical College Association do not yet refer to the topic of preliminary medical education.

Meantime, for how long is to be allowed to continue the condition of things described in the following passage?

"Any young man without mental training, without the slightest classical or scientific acquirement, without even a respectable English education, can enter upon the study of medicine unquestioned, and pass every portal leading to the profession unchallenged" (7, 14).

Consequently, while the professional schools are commonly supposed to stand upon a higher plane than the colleges, it is notorious that he who fails to pass the examination for entrance to the freshman class in a college may commence the study of medicine without impediment.

It is obviously the duty of the older and more flourishing schools to set the example in respect to requirements for admission. This has been done by a few,¹ but at the close of the opening paragraph of the last announcement of one of the largest New York schools are the words, "No PRELIMINARY EXAMINATION IS REQUIRED."²

So high, so noble, so responsible is the office of the physician, that entrance to the medical profession should be more difficult than to any other. And the non-preparation, or even mal-preparation, of the average candidate for his sacred calling of saving life is only to be compared with the non-preparation, or even mal-preparation, of the average parent when he performs the act of initiating the existence of a new human being.³ And as, in consequence, the troubles of many people began nine months before they were born, when no one

¹ Harvard, Michigan, and, more recently, Pennsylvania.

² In contrast to this, I take pride and pleasure in stating that the Medical School of Maine, a "country school," this spring refused admission to several applicants, in consequence of failure to pass an entrance-examination.

³ On this matter, *see* the conclusions of Prof. Law (15).

thought anything about them, so the conditions which determine the success or failure of the physician are too often determined long before his proper medical studies commence.

It may be urged that the requirement of entrance-examinations upon so many subjects will, at any rate primarily, lessen the revenues of the schools, and diminish the number of physicians. No doubt these are conclusions logically sound, but unattractive. Abstractly they commend themselves, but practically they fail to harmonize with the desires of the natural man both for flourishing schools and for a numerous and powerful profession.

To answer these objections in full would unduly extend this article. In brief, however, I will say that the schools should be *endowed*, as are ordinary institutions of learning; that the doctors should be fewer, but more competent; and, finally, that the public should be much better educated in physiological and hygienic matters, so as to avoid disease, and thus require less medical attendance.¹

My conclusions may be stated briefly as follows:

1. Comparative anatomy, as usually understood, is the study of the structure of vertebrates.

2. In addition to uses common to all branches of natural history, comparative anatomy presents special advantages to the medical student. It forms a convenient and economical introduction to human anatomy, enabling the student to acquire skill of manipulation, and familiarity with organs and their names.

3. In particular, the comprehension of the general arrangement of organs and of their structure may be greatly facilitated by a previous examination of corresponding parts of simpler forms, especially the *Amphioxus*, the frog, the cat, and monkey.

4. Comparative anatomy for the medical student should be restricted to such forms and topics as may aid his special studies.

5. The courses of lectures in most medical schools, espe-

¹ These questions were discussed at some length in the lecture as delivered.

cially in the United States, are already too short, and afford no time for extended or systematic instruction in comparative anatomy. But it might well occupy some part of the time of medical pupilage which is not passed in the schools. Still better, it should form a prominent element of a *preliminary medical education*.

6. The preliminary education of medical students should be *general* and *special*. *General* in respect to mathematics, drawing, English, logic, French, and German, with a small amount of classics, and the sciences, especially biology; *special* in respect to more extended practical work in the comparative anatomy of vertebrates, including training in the methods of anatomical manipulation and physiological experimentation.

7. On many accounts it would be advantageous to extend the medical curriculum so as to bring the special training above described under the direct supervision of the medical faculty.

8. The elevation of the standard of medical education demands: *a.* High requirements for admission. *b.* Lengthening of medical terms to nine months, not so much in order that more may be taught, as to allow time for digestion and assimilation of what is already presented in four, five, or six months. *c.* Systematic gradation of studies, and exclusion of first-year students from clinics and hospital-wards. *d.* Increase of time for instruction in physiology and hygiene. *e.* Endowment of the chairs, making the salaries independent of the number of students or of graduates. *f.* Separation of the teaching-body from the licensing-power, the latter being under central and national control.

9. Finally, to return to the original question, if it be asked whether systematic instruction in comparative anatomy should be included in the two courses of lectures now required for graduation in most American medical schools, I would answer, unhesitatingly and emphatically, "No." But if it be asked whether this same instruction should be received at some time before graduation, I would answer, "Yes, and a great deal else which is not now required."

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ART. II.—*Pyæmia and Septicæmia*.¹ By B. A. WATSON, M. D., Surgeon to Jersey City Charity and St. Francis Hospitals, Jersey City, N. J.

I. HISTORY.—The morbid conditions now designated pyæmia and septicæmia were recognized by the "Father of Medi-

¹ President's Address before the New Jersey Academy of Medicine at its Annual Meeting, June 20, 1877.

cine," who reports¹ a well-defined case of puerperal fever terminating fatally on the twentieth day of the disease; and also the following fatal case of erysipelas: "Criton, in Thasus, while still on foot, and going about, was seized with a violent pain in the great-toe; he took to bed the same day, had rigors and nausea, recovered his heat slightly, at night was delirious. On the second, swelling of the whole foot, and about the ankle erythema, with distention, and small bullæ (phlyctænæ); acute fever; he became furiously deranged; alvine discharges bilious, unmixed, and rather frequent. He died on the second day from the commencement."²

Further confirmation of the fact that Hippocrates was familiar with the phenomena of these diseases may be found in his dissertation on "Empyæma and Fevers."

Prof. C. Hueter, under the head of "Septic Fever," says: "Hippocrates and Celsus observed the fever in cases of injuries which proved so dangerous, and that this danger must have originated neither from the inflammation nor from the wound alone, but from some unknown cause.

"Jacotius, a commentator of Hippocrates, has even mentioned putrid fevers, the same as Adrianus Spigelius, who spoke of fevers which arise from putrefaction; but both authors, as well as their followers, did not discriminate between septicæmia arising from the putrescence of wounds, and pyæmia. In the mean time, both varieties were regarded as intermittent fever."³

"Aretæus lived during the middle of the second century of the Christian era. In his remarks on pneumonia, Aretæus observes that the subjects of this disease die mostly on the seventh day. 'In certain cases,' he says, 'much pus is formed in the lungs, or there is a metastasis from the side if a greater symptom of convalescence be at hand. But if, indeed, the matter be translated from the side to the intestine or bladder, the patients immediately recover from the peripneumony.' He speaks of metastasis to the kidneys and bladder being pecul-

¹ Works of Hippocrates, translated by Adams, vol. i., p. 373.

² *Ibid.*, p. 377.

³ Pitha u. Billroth, "Handbuch der Chirurgie," 1. Band, 2. Abth., 1. Heft, 1. Liefg., 6. S.

ially favorable in empyema. He ascribes suppuration of the liver to intemperance and protracted disease, especially from dysentery and colliquative wasting. The symptoms described by him resemble those of chronic pyæmia.”¹

A new era in the literature of this subject dawned during the sixteenth century.

Ambroise Paré and Bartholomew Maggi each published a work in which they pointed out the old errors and announced new truths. Carl Thiersch, in his lecture on “*Klinische Ergebnisse der Lister'schen Wundbehandlung und über den Ersatz der Carbolsäure durch Salicylsäure*,” says: “When, in the year 1536, a strong army of the ‘famous King Francis’ marched over Mt. Cenis into Piedmont, it was accompanied by an inexperienced surgeon only nineteen years of age—the subsequently so highly honored Ambroise Paré. The storming of the mountain citadel of Vallane, near Susa, gave him indeed, for the first time, plenty to do, and he put in practice everything in accordance with the example of his older colleagues. Like them, if also with fear, he poured the boiling oil of elder into the gun-shot wounds, in order to destroy the poison; but as there was not sufficient oil, he was compelled to dress the remainder of the wounded with a salve prepared from oil of rose and turpentine. Pained by the fear that the latter, in a short time, would become a sacrifice to the poison, he passed a sleepless night, arose early from his bed in order to examine the unfortunates, but was greatly surprised to find the half-given-up almost free from pain, without inflammation or swelling. ‘Then I determined,’ said he, ‘never again to burn the poor wounded soldiers so cruelly.’”

Paré’s “Treatise on Gun-shot Wounds” first appeared in Paris in 1551, fifteen years after the occurrence of the previously-narrated event, in which he declared in favor of the non-poisonous character of these wounds. He had spent a part of the intervening time in Italy, and it is supposed that he there became acquainted with the investigations of the learned Bologna physician, Bartholomew Maggi, and had appropriated to himself the demonstrations on the non-poisonous nature of gun-shot wounds. Maggi’s treatise appeared a year later (1552),

¹ Braidwood on “Pyæmia,” p. 2.

at Bologna. In whatever manner Paré may have obtained the priority, certain it is that it required all the influence which he in more mature years enjoyed, especially in things pertaining to military surgery, in order to provide a gradual introduction for the new theory. Still one meets with the old error among the more modern physicians. How this error could have attained such a widespread influence is, indeed, scarcely susceptible of demonstration. It is certain that, originally, gun-shot wounds passed for contused wounds, and were usually treated with warm, moist poultices. But as gun-shot wounds are naturally inclined to a bad course, especially if complicated with a fracture, and as this bad termination has become more frequent since the introduction of firearms, depending on an increase in the number of that kind of injuries, while the care of the wounded at that time was always insufficient: in this way was encouraged the formation of a false opinion, based on the experience at the bedside, of the special danger of gun-shot wounds.

Cases of acute sepsis which developed after the infliction of gun-shot wounds, and which agreed in essential points with the results of the bite of poisonous snakes, had given a turn to events. There were such cases during the late Franco-Prussian war, which here and there among the laymen even excited suspicion that the enemy used poisoned missiles.

Thus it was only necessary for Johannes de Vigo, in the commencement of the sixteenth century, to express in dogmatic form the already firmly-held views of physicians. "The gun-shot wound," said he, "is a contused wound, for the ball is round; it is a burned wound, for the ball is heated; it is a poisoned wound, for the powder is poisonous. The poison is the chief characteristic; therefore the treatment should be directed against that, before anything else." And it was on this theory that J. de Vigo stood to decide the fate of gun-shot wounds for many years. Among the different forms of treatment, that most frequently used against the poison was the repeated application of escharotics—e. g., pouring boiling oil into the fresh wounds. Should the topic of discussion at the present time be the treatment of wounds, then it might be said that this historical information was rather far-fetched;

nevertheless, the lapse of three and a half centuries is only apparently a long time. The theoretical error is merely removed, but there remains the undetermined question which Paré sought to explain. We no longer seek the poison in the powder and lead; but, as at that time, we speak of a poisonous effect of the wound on the body; now, as then, this poisonous condition forms the central point of our therapeutical efforts. Indeed, J. Lister's first method of cauterizing fresh wounds with concentrated carbolic acid has certainly much to remind one of the burning-out of gun-shot wounds in the citadel of Vallane. That a poisonous substance develops in wounds, or may insinuate itself into them, more especially in gun-shot wounds—a substance which has nothing to do with powder and lead—was the next step advanced. Paré himself came to this conclusion.

When he was present with the besieging army before Rouen, many of the wounds became putrid, and the stench arising from them highly offensive. In the bodies of the dead on whom autopsies were made, there were found numerous pus infarections in various organs. The pus was greenish and the odor very disgusting. Besieger and besieged believed themselves wounded with poisoned missiles. Paré sought the cause in the contamination of the atmosphere through the accumulation of decaying material, and advised for such cases the scabbing treatment: cauterization with Egyptian ointment, prepared from equal parts of alum, verdigris, and sulphate of copper. Thus he seems to have accepted the doctrine, as it is received to-day, that there is an immediate effect produced on the wound by the vitiated air. The contaminating influence of the air, combined with the products of putrefaction, not merely on the wound but on the organism generally, has never disappeared from the intellectual horizon of physicians. That the mouldering couch of straw, the putrefying bodies of men and animals, the floor and earth saturated with excrement, the overcrowding of badly-ventilated hospitals, give rise to infectious fevers and a bad course to wounds, is not the result of recent observation; also, that it depends on a kind of fermentation, which, by means of the germs contained in the air, is transferred to the body, has be-

come a familiar notion; citing one only of the many authors on this subject, viz., John Pringle, in his "Observations on the Diseases of the Army," published in 1775, in which he devotes a special chapter to the diseases in consequence of the more putrid air, and his forty-eight experiments on septic and antiseptic substances. This chapter contains experiments similar to those made at the present day, in order to prove the anti-putrefactive power of this or that material. Still there remains a vague idea of the nature of the substance which excites putrefaction, and they are mostly sought among the gaseous, bad-smelling products of decomposition.¹ "Ambroise Paré (1582) first taught that secondary abscesses in surgical cases," which he had observed in the spleen, lungs, liver, and other viscera, "were due to a changed condition of the fluids, produced by some unknown alteration in the atmosphere, and determining a purulent diathesis."²

"He also recognized the fever which is dependent on the production of pus, and classified here especially that fever which arises between the tenth and fourteenth days after the receipt of an injury, and is ushered in by a chill."³ The following quotations force the conclusion that in the early history of medicine there was supposed to be some important relation between wounds of the head and multiple abscesses:

"Nicolaus Massa (1553) mentions a case of abscess of the left lung, following an injury of the head."⁴

"Valsalva (1707) was induced by his own observations to say that the viscera of the thorax were sometimes affected in wounds of the head."⁵

"Desault (1794) considered abscess of the liver to be a very frequent sequence of head-injuries."⁶ The fact that wounds of the head were frequently followed by abscesses of the lungs, liver, and other organs, probably led to the opinion expressed by Desault, Barthez, Brodie, W. Phillips, Copland,

¹ Volkmann's "Sammlung klinischer Vorträge," No. 84 u. 85, S. 639.

² Braidwood on "Pyæmia," p. 2.

³ Pithe u. Billroth, "Handbuch der Chirurgie," 1. B., 2. A., 1. II., 1. L., 57. S.

⁴ Braidwood on "Pyæmia," p. 2.

⁵ Ibid., p. 3.

⁶ Ibid., p. 5.

and others, that the disease had its origin from a nervous agency.

“Bertrandi and Audouillé (1819) sought for a mechanical explanation of the occurrence of hepatic abscesses after head-injuries, and in cases of apoplexy.”¹

“Morgagni (1740) somewhat obscurely hinted at the doctrine of the reabsorption of pus—a doctrine which was afterward elaborated by Quesnay in 1819. Morgagni, after quoting a great number of instances of wounds of the head followed by visceral abscesses, opposes the idea of a mechanical transport of pus thither—states that such abscesses are not confined to the liver—and that they may follow wounds and ulcers of other parts besides the head. He ascribes their formation to particles of pus (‘not always deposited in the form of pus’), resulting from the softening and suppuration of small tubercles, which, having been mixed with the blood and disseminated, are arrested in some of the narrow passages, perhaps of the lymphatic glands, and by obstructing and irritating these, as happens in the production of venereal buboes, and by retaining the humors therein, distend them, and give origin to the generation of a much more copious pus than what is carried thither. ‘And by this means,’ he says, ‘we may also conceive how it is that much more pus is frequently found in the viscera and cavities of the bodies than a small wound could have generated.’”²

“Cheston (1766) remarks that ‘translations of matter from one part to another are by no means uncommon, but are frequently to be met with after amputations of the larger limbs, when the *vis vitæ* is impaired, and cannot support that discharge of matter, so necessary to complete the design of Nature in healing a large wound; but, under such circumstances, there is very little, if any, appearance of an inflammation, and the matter is rather disseminated through the viscus on which it falls, than is collected in one or more large vomicæ.’”³

“John Hunter (1793), in this country, and after him Velpeau, in France, demonstrated the existence of pus in blood. Hunter further pointed out the influence and mode of action

¹ Braidwood on Pyæmia, p. 10.

² *Ibid.*, p. 3.

³ *Ibid.*, p. 4.

of phlebitis. He described three forms of inflammation of the veins—viz., adhesive, suppurative, and ulcerative. Pyæmia he considered to be an aggravated form of phlebitis. He remarks that in all cases where inflammation of the veins runs high, or extends itself considerably, it is to be expected that the whole system will be affected.”¹ Hodgson (1815) believes in the doctrine of phlebitis, “and affirms that the inflammation extends in some instances even to the membrane which lines the cavity of the heart.”²

“Arnott (1829) concluded from his observations—1. That death does not result from the extension of the inflammation of the veins to the heart; 2. That the dangerous consequences of phlebitis have no direct relation to the extent of the vein which is inflamed; and, 3. That the presence of pus in the veins, though the principal, is not the sole cause of the secondary affection. He, accordingly, opposes the idea of Abernethy, Carmichael, etc., that the constitutional affection is owing to the extension of the inflammation to the heart. The publication of Arnott’s and Dance’s treatises led to the general opinion being held in England and France that phlebitis and purulent infection were identical affections; or, at least, that the latter was invariably caused by the former.”³

“Cruveilhier (1829), admitting the doctrine of the formation of secondary abscesses being due to capillary phlebitis, further laid down an axiom, since proved untenable, ‘that any foreign body introduced into the veins, whose elimination by the emunctories is impossible, will produce visceral abscesses similar to those which occur after wounds and operations, and that these abscesses are the result of capillary phlebitis of those viscera.’”⁴ Liston (1837) and Bérard (1842) held the phlebitic doctrine. The following authors believed pyæmia to be produced by the admission of pus into the blood, viz.: Boerhaave and Van Swieten (1737), Morgagni (1740), Cheston (1766), Berthelot (1780), John Hunter (1793), Larrey (1812), Montezzia (1813), R. Carmichael (1818), Quesnay (1819), Velpeau (1823 and 1826), Sir Astley Cooper (1827), Maréchal (1828), Dance

¹ Braidwood on “Pyæmia,” p. 4.

² *Ibid.*, p. 7.

³ *Ibid.*, p. 14.

⁴ *Ibid.*, p. 14.

(1828), Arnott (1829), Piorry (1831), Liston (1837), Dupuytren (1839), Castelnau and Ducrest (1848), Sédillot (1849), Solly (1851), Wilks (1861), and Baker (1866). "Haller made the first experiments as to the action of putrefying substances on animals, and said, 'Nothing destroys our fluids more powerfully than putrefaction.' B. Gaspard, Doctor of Medicine in St.-Étienne, published the first complete work, founded on abundant experimental material, on the action of putrefying substances on the organism; and since that time (1822) one may look upon the doctrine of septicæmia as established. Leuret and Dupuy followed him; so that in France the doctrine of septic blood-poisoning soon won the ground. Soon, however, the investigators who followed them rejected both the septicæmic and pyæmic conditions, and the effect of the former investigators could have been only unimportant. Ernst R. Virchow, who repeated the experiments of Gaspard, discriminated with *greater precision* between the surgical diseases—septicæmia as a *sharply-defined* group, the opposite of pyæmia. From this date (1848) the difference between septicæmia and pyæmia has been fully established in the literature. . . . The most important series of experiments conducted according to Gaspard belong to Stich (1853) and Panum (1856); the latter endeavoring to separate the putrefying poison. In this, however, neither he nor his followers have succeeded very satisfactorily. These experimenters were followed by Urfrey, Saltzmann, and others. . . . In 1865-'66 the Faculty of Medicine in Munich offered a prize-question on the action of putrefying substances on the animal organism, and awarded the prize to Hemmer for his work, which was distinguished for its accurate delineation of the pertaining literature and the number of prepared experiments. In the mean time Pasteur was making a noise in France by his researches. . . . Billroth, Roser, and O. Weber published new and valuable works, which considered the observations at the bedside, as well as the experiments."¹

"Lister, fully appreciating the necessity of protecting wounded surfaces, as far as possible, from the contaminating in-

¹ Pitba u. Billroth, "Handbuch der Chirurgie," 1. B., 2. A., 1. II., 1. L., 6. u. 7. S.

fluences arising from contact with the vitiated air of hospitals, has, by the antiseptic treatment, already accomplished much good. He still adheres to the use of carbolic acid. Binz has proved that a solution of one part of quinine to four hundred parts of water still sufficed with certainty to destroy the life of bacteria. R. Geissler, a few years previously, had mentioned the anti-putrefying property of the salts of quinine, and has used the same as a surgical dressing in carbuncle, cancer, bed-sores, etc.”¹

Bergmann, and others, have sought to determine the poisonous element contained in decomposing animal substances, and for this purpose have chemically treated putrid fluids, hoping to find the agent that would excite all the symptoms of septic poisoning. Bergmann obtained a body of this nature from decomposing yeast, which he calls *sepsin*, although we have no proof that either he or any one else has ever found the same in pus or any decomposing animal substance; and even if it had been found in these substances, it would then become necessary to demonstrate the fact that no other substance contained in putrefying fluids could produce septic poisoning. It has, however, been satisfactorily shown that several elements found in decomposing animal bodies, when injected into the blood, excite septic action.

II. NOMENCLATURE.—The want of an established nomenclature of pyæmia, and the loose manner in which the terms pyæmia and septicæmia are used by the profession, have doubtless led to much embarrassment.

It will be observed that the early writers on medicine were ignorant of the causes of these diseases, as well as of their pathology. Prior to the publications of Ambroise Paré and Bartholomew Maggi, we find that the diseased conditions now described as pyæmia and septicæmia were supposed to be due to a direct poisonous influence of the powder in cases of gun-shot wounds. It appears that the first pathological condition that attracted the attention of the early observers was the formation of metastatic abscesses in the lungs, liver, and kidneys. At that time the deposits were usually supposed to arise from the mechanical transport of pus from

¹ Langenbeck, “Archiv f. klin. Chirurgie,” Band 4, S. 550, 564.

wounds on the surface to the visceral organs. At a later period, John Hunter, and others, supposed pyæmia and phlebitis to be identical diseases; but the more modern writers have used the term "suppurative fever." "*Virchow* has proposed the name *ichorrhæmia*. *O. Weber* uses the name *embolhæmia* for the condition in which emboli are found in the blood. The classification given by *Hueter*, in his excellent work on this subject, appears to me very practical. In pure cases of purulent infection without metastasis he calls the disease 'pyohæmia simplex;' in cases with metastasis, 'pyohæmia multiplex.'"¹ The term hospitalism is used by John Eric Erichsen and Sir James Y. Simpson. The former says: "The overcrowding of wounded people—whether the wound be accidental or surgical matters not—will develop septic disease in one of four forms, viz., hospital gangrene, septicæmia, pyæmia, or erysipelas."² And the latter: "The general and acknowledged cause of death after operations in hospitals is some of the forms of surgical fever—as pyæmia, erysipelas, phagedæna, etc."³

Erichsen further says, "The term pyæmia is used in a very wide and elastic manner, and by many is made to include various forms of blood-poisoning."⁴ This remark is especially true of the English writers. Thus G. W. Callender, under the head of "Pyæmia," says: "It signifies little whence these matters are derived—whether from decomposing pus, unhealthy secretions, decomposing hides, dead bodies, vegetable putrefactions, or from animals suffering from acrid discharges, as in glanders; since the influence of all such, regulated by the intensity of the poison, for they vary in this respect, and by predisposing causes presently to be mentioned, may be conveniently described under two modifications."⁵ The modifications here referred to are designated as *acute* and *chronic*.

American authors, much more than the English, are inclined to use the term pyæmia in the restricted sense. In

¹ Billroth, "Surgical Pathology," p. 345.

² "On Hospitalism" (1874), p. 59.

³ "Anæsthesia, Hospitalism," etc., p. 350.

⁴ *Loc. cit.*, p. 73.

⁵ Holmes's "System of Surgery," vol. i., p. 253.

fact, the German nomenclature has already been adopted in a great measure; and the present indications are, that at no distant day this perplexing question will be finally settled. A correct idea of the sense in which the Germans use this word may be derived from the following extract from Prof. C. Hueter, who says, "If we give to pyæmia, at the start, a definite scope, then we must regard suppuration as the *first* and *most necessary condition* for its existence."¹ The above remark is the foundation, and at the same time supplies the boundary, for the use of the term pyæmia by a large majority of German practitioners, although Prof. Roser divides the cases of septic blood-poisoning into four classes: "(1.) Traumatic sepsis (pure traumatic, primary traumatic sepsis). (2.) The poisoning with ichorous pus (secondary infection, self-infection). (3.) Infection from dissecting wounds and similar material (infected wounds). (4.) The specific zymotic septic process (hospital gangrene, carbuncle, cancer, etc.)."

"Stromeyer furnishes the following classification, viz.: (1.) A very rapid decomposition of the blood prior to the commencement of suppuration. (2.) Acute pyæmia with the commencement of suppuration. (3.) Subacute pyæmia. (4.) Chronic pyæmia."²

It will be observed that Stromeyer's classification does not differ materially from the one ordinarily used. The first order refers to septicæmia, while the second, third, and fourth indicate the varieties of pyæmia.

Roser's classification is intended to cover all cases of septic blood-poisoning, which may truly be viewed as a single chain composed of many links. Take, for example, a case of amputation of the thigh, followed within a few hours by traumatic fever, later by septicæmia; afterward there may develop-secondary fever, formation of ichorous pus with absorption, and its concomitants, pyæmia, accompanied by embolism, thrombosis, abscesses in the lungs, liver, etc. To these may also occasionally be added phlebitis, inflammation of the joints, terminating speedily in suppuration. The chain may

¹ Pitha u. Billroth, "Handbuch der Chirurgie," 1. B., 2. A., 1. H., 1. L., 89. S.

² Ibid., 40. S.

in this case be further lengthened or varied with traumatic erysipelas, hospital gangrene, etc. In fact, the variations in these cases are very numerous, and all these conditions, together with many others, are due to septic blood-poisoning. The nomenclature of septicæmia requires little attention here, although now and then we find the terms "septic fever" or "putrid fever" used in its place.

III. PATHOLOGY.—The study of the pathology of pyæmia may be advanced by adopting Hueter's classification, which is based on recognized post-mortem lesions, and designated pyæmia simplex and pyæmia multiplex. The pathological appearances in these forms of the disease differ widely, although the clinical symptoms are often similar. In pyæmia simplex the pathological conditions are essentially more negative. This variety of the disease can only destroy life by the height and duration of the fever, which is maintained by the absorption of the fluid or molecular elements of pus. There is found, as an essential basis of this form of the disease, extensive suppuration in the subcutaneous or subfascial tissues. We are not able to demonstrate the pyrogenous substance in the blood, since its chemical composition is unknown. It is supposed that possibly the pyrogenous material finds its admission into the blood with the pus-corpuscles, but still it remains to be proved that pus-corpuscles are thus admitted. The arguments in favor of the admission of the pus-corpuscles into the blood are as follows: 1. The blood in pyæmia is known to contain more white granular spherical bodies than are normal. The question has been raised, Are they pus-cells, or white-blood-corpuscles? The answer is difficult, and has not yet been attained. Virchow, in the mean time, has proved that we cannot differentiate, morphologically, between blood and pus corpuscles. 2. Cohnheim has demonstrated the existence of the wandering corpuscles in cases of inflammation. Therefore it appears probable that in cases of pyæmia the blood may contain the pus-corpuscles, but further investigation is needed to establish the fact. However, the establishment of this point would still have the more important one undetermined. Billroth supposes the pyrogenous substance exists in connection with the pus-corpuscles; but this may be

justly questioned after the experiments of O. Weber and Frese. These experiments consisted in carefully filtering pus and then injecting the filtrate into healthy animals. It was found that these injections were uniformly followed by a marked increase in the temperature. Therefore, these investigators supposed that the pyrogenous elements of the pus are contained, at least in part, in its serum. There are other important changes observed in the blood of patients dead of pyæmia, to which I desire now to direct attention. The red corpuscles of the blood, even in the early stages of the disease, in many cases show signs of disintegrating into molecules, and are observed to be accumulated in masses without showing the slightest tendency to form roulettes. There is a steady increase in the number of pus or white-blood corpuscles in the blood of pyæmic patients, during the whole course of the disease, in fatal cases. The condition of the red corpuscles, already mentioned, becomes more and more marked toward the fatal termination. In all cases of pyæmia multiplex the increased coagulability of the blood may be observed in the early stages of the disease, which steadily increases as the disease progresses. In pyæmia simplex this condition is less marked, although generally present; "while, e. g., we know septic poison diminishes or destroys the coagulability of the blood. Hereby the possibility is given, at least on the cadaver, to differentiate between pyæmia simplex and septicæmia; if, in the mean time, the study of the pathology of septicæmia was prosecuted even by comparison, since cases occur of the more fatal septic infection, in which the post-mortem condition is a complete, or almost complete, negative. Therefore the differential diagnosis on the cadaver must be limited to this, that we are able to demonstrate the existence of a purulent or ichorous deposit."¹ It will be readily observed that the differential diagnosis mentioned above relates to pyæmia and septicæmia, and not to the different varieties of the former disease. The following facts should be kept constantly in mind by the surgeon, to enable him to differentiate between the two forms of pyæmia. In pure cases of purulent infection without me-

¹ Pitha u. Billroth, "Handbuch der Chirurgie," 1. B., 2. A., 1. H., 1. L., 70. S.

tastasis, the disease is called pyæmia simplex; and in cases with metastasis, pyæmia multiplex. The various conditions on which the metastasis may depend are shown by Hueter, who says: "The metastatic abscesses of pyæmia multiplex met with in the lungs, liver, spleen, and other internal organs, are regarded, with the greatest possibility, as a result of the embolic process. The metastatic inflammation of the serous membranes, of the cellular tissue, and of the parotid glands, and probably also a few metastatic inflammations of the internal organs, are at present supposed to arise from a general inflammatory diathesis."¹ It has already been shown, by numerous experiments on animals, that metastatic abscesses in the lungs, liver, and other visceral organs only arise after the introduction of ichorous pus, while healthy pus has uniformly failed to produce this result. I shall take occasion to refer to this subject more fully under the "Etiology of Pyæmia." It now remains to be shown how the introduction of ichorous pus acts in the production of pyæmia multiplex. The ichorous pus, having found its way into the venous circulation, gives rise to the formation of thrombi in the veins; these clots become more or less broken up, and are carried forward by the blood to the right auricle; from this auricle to the right ventricle; from this ventricle to the pulmonary artery, and through its ramifications to every part of the lungs. In the minute ramifications of this vessel are found wedge-shaped clots of various sizes, in different conditions, some softened and others still firm. The possibility of these clots ever passing through the lungs, and afterward being arrested in other visceral organs, has been demonstrated on animals. It has been shown that fine particles of foreign matter, injected into the veins, have passed through the lungs, and subsequently lodged in the liver. This theory enables us to account for the existence of metastatic abscesses in the liver, which have apparently originated as the result of primary infection, but thus far only on a mechanical basis. In other cases these abscesses are supposed to arise from secondary infection. Thus ichorous pus, having found its way into the venous circulation, produces primarily venous thrombi, which, as in the other instances,

¹ Ibid., 88. 8.

break up, the clots being carried in the same manner into the terminal branches of the pulmonary artery, where they are designated as emboli. The first action of the emboli is the mechanical closure of these vessels, thus depriving the surrounding parts of nutrition, to a greater or less extent. It will be proper now to recall the fact that the composition of these emboli is such as to favor rapid suppuration; this commonly commences in the clot and surrounding tissues, having been preceded by a brief stage of congestion and inflammation. There is also occasionally found around these points more or less extravasation. The metastatic abscess thus found in the lungs is favorably situated for the production of secondary infection. From this abscess thrombi arise in the pulmonary veins, which become disintegrated, and are carried to the auricle, thence to the left ventricle, and finally through the aorta, and find lodgment in the terminal branches of the arteries of the various organs, where they produce the characteristic trouble. The organs that most frequently become the seat of this secondary infection are the liver, spleen, kidneys, brain, and eyes. Let us now briefly examine this mechanical theory. Do metastatic abscesses arise from a single cause, or from a combination of causes? I am inclined to the opinion that the proximal cause of metastatic abscesses in the visceral organs is the existence of emboli in the terminal branches of arteries. The vitiated atmosphere surrounding the patient, the existence of a wound, and the formation of ichorous pus, are conditions which should not be lost sight of. These are the elements acting on the blood, producing in it morbid changes, and may therefore be regarded as the predisposing causes. The morbid condition of the blood, the increased number of white-blood-corpuscles (possibly pus), the disintegration and other changes in the red corpuscles, may be regarded as the exciting causes of metastatic abscesses. It is thus readily observed that emboli may form in the lungs and liver at the same time, or the origin of those in the lungs may precede the formation in other organs. Again, the formations may be limited to a single or exist in several organs at the same time. Is the formation of emboli in the terminal branches of arteries always dependent on the disintegration of

thrombi? The answer to this question must, I think, be a negative, although in surgical practice it rarely happens that an embolus takes its origin from any other cause. In the large majority of cases, unquestionably, the thrombi primarily exist in the vicinity of the wound in which the ichorous pus is generated; but it not unfrequently happens, during the process of disintegration, that broken-up clots are carried forward by the current of blood, receiving accretions on the way, until finally they fill a large venous trunk. In confirmation of these facts relating to the primary origin of thrombi, it is said to have been observed, in epidemics of "puerperal fever" which were complicated with metastatic abscesses of the visceral organs, that the thrombi occurred in the pelvic veins. In case of wounds of the lower extremity the clot is frequently found in the common iliac vein, although probably it should always be regarded as a secondary formation. In rare cases the only thrombi discovered at the autopsy are found situated far away from the injury. Billroth records the case of a young woman who died of phlegmonous erysipelas of the lower extremities, where thrombi were only found in the brain. Observation fully establishes the fact that pathological changes are much more frequently met with in the lungs than in any of the other organs of patients dead of pyæmia. This certainly strengthens the embolic theory. Billroth mentions eighty-three cases of true pyæmia multiplex in which the metastatic abscesses occurred as follows: seventy-five times in the lungs, seventeen times in the spleen, eight times in the liver, and four times in the kidneys.

"Prof. Sédillot, of Strasburg, who has studied this disease with great care, and who has combined the results of his observation in a highly instructive and interesting monograph, published in 1849, remarks that, in one hundred cases of pyæmia, we should find the lungs affected in ninety-nine; the liver and spleen in one of twelve, the muscles in one of fifteen, and the heart and peripheric cellular tissue in one of twenty; the brain and kidneys are comparatively seldom involved."¹ The theory previously mentioned as the embolic relates to the aggregation of the fibrine into clots; but another

¹ Gross, "System of Surgery," vol. i., p. 150.

theory has been recently advanced by E. Wagner, who "found in many cases the capillaries in the lungs filled with fat, and was inclined, from the direction it extended in these vessels, to explain a certain number of the pyæmic cases by the fat-emboli. Here arose the necessity for the experimental examinations of this question, which were soon undertaken by different parties. As still further pathological observations followed these experiments, so arose over the question of fat-emboli an extensive literature, to the analysis of which I cannot now give my attention. This condition is not very rare, especially after severe injuries of bones; and the medullary substance appears to be the most frequent source of the fat-emboli, although the fatty connective tissue, the collection of fat-drops in venous thrombi, etc., are also to be taken into consideration. The easiest method to produce the fat-emboli experimentally is by crushing a medullary cavity in animals, or otherwise by the direct introduction of fluid fat into the veins. We have satisfied ourselves, by such experiments, that fat-emboli destroy life only when the occlusions of the capillaries of the lungs are very numerous, and when the act of respiration is thereby greatly disturbed. Insignificant fat-emboli are easily borne. The existence of fat-emboli in pyæmia is therefore purely accidental, and has no characteristic significance. Multiple pyæmia very frequently occurs without fat-emboli, and *vice versa*; either process may complicate the other, and so the fat-emboli may acquire special importance by obstructing the respiration, and probably also in this way the embolic fat may serve as a carrier of a putrid and phlogogenous material."¹ Having already examined the theories pertaining to the various forms of pyæmia, and the general characteristics of this disease, as well as of septicæmia, we are now prepared to begin with the *post-mortem appearances of pyæmia multiples*.

General Appearance of the Body.—Rigor mortis, commonly well marked a few hours after death; great emaciation, and other important changes, rendering the appearance of the body repulsive, and sometimes hideous.

* ¹ Pitha u. Billroth, "Handbuch der Chirurgie," 1. B., 2. A., 1. H., 1. L., 88. u. 89. S.

Skin and Cellular Tissue.—The integument is flabby, pale, or occasionally of a deep icteric hue; sometimes sudamina, circumscribed ecchymoses, pustular eruption, irregular spots of a dusky color, gangrenous patches, etc. The cellular tissue in some cases is the seat of diffuse suppuration. The pus formed is generally thin, fetid, and unhealthy. This suppuration may be limited to certain parts of the body, as an injured extremity, or, as frequently happens, it may be found on the trunk and limbs at the same time. The pus in this form of suppuration is exceedingly apt to burrow, on account of the peculiarities of the tissues in which it occurs, and also the condition of the surrounding structures, especially the relaxed and flabby condition of the skin. These abscesses in some instances are superficial, in others deep-seated. The edges of the wound, after death, are of a blackish-green color, frequently showing evidences of the separation of a recent slough. The surface is usually dry, but may be covered with foul pus.

Muscles.—There are few changes which occur in the muscles, and none are uniform or constant. They are occasionally the seat of abscesses, and these have been observed in the heart, tongue, and other organs. They may be of a light-brown or greenish color, when they have been covered for a considerable time with pus, and are sometimes softened and pultaceous. Suppuration does occasionally take place beneath the fascia of the tendons.

Brain and its Membranes.—Neither the brain nor its membranes are constantly the seat of pathological changes, although congestion of one or more of its membranes is by no means rare, “particularly where death has been preceded by great dyspnœa.”¹ Occasionally there have been observed suppurative meningitis, engorgement of the venous sinuses, blood-extravasations on the surface of the brain, lymph-deposits on the membranes, softening of the cerebral tissues, circumscribed abscesses in the substance of the brain, which in some cases have been traceable to embolism of its vessels. The fluids in the ventricles may be either diminished or increased, and very rarely are found mixed with pus. The

¹ Pitha u. Billroth, “Handbuch der Chirurgie,” 70. S.

changes in the spinal cord and its membranes probably are similar to those found in the brain, but appear to have been rarely examined.

Eyes.—"H. Meckel first called attention to the fact that examinations of the eye in persons who died of pyæmia, which is certainly rarely enough performed, might lead to the discovery of pyæmic ophthalmia. Virchow found, in a few such cases, emboli of the retinal and choroidal vessels. Probably this would be proved correct by more industrious examinations of the eye, that these conditions are somewhat less seldom than, until now, had been supposed."¹ "Arnott thus describes this affection of the eye: 'There is redness of the conjunctiva, intolerance of light, and contracted pupil; rapidly followed by opacity of the cornea, and excessive chemosis. The eye ultimately sloughs, and its contents escape.'"²

Ears.—"The late Mr. Toynbee, in his admirable treatise on 'Diseases of the Ear,' relates several cases of 'purulent infection' following suppuration in the ear. 'Cases of disease in the mastoid cells terminate fatally,' he says, 'from two different causes: first, from purulent infection, arising from the introduction of pus into the circulation through the lateral sinus; second, from disease of the cerebellum or its membranes. Cases of purulent infection,' he further remarks, 'have not been met with when the disease occurs in the tympanic cavity.'"³

Bones.—There are numerous changes, in pyæmic cases, occurring in the bones—probably from the fact that pyæmia results very frequently in cases of bone lesions; but these changes have very little diagnostic importance. The following have been observed: thickening, absence, or infiltration of the periosteum, which may be found to separate readily from the bone after the death of the patient; or there may be pus found between the periosteum and bone. In the bone-structure there are found caries and necrosis, "while in other cases the whole thickness of the 'compact' tissue is perforated in a honeycomb-like manner by minute cavities, filled with thickish

¹ Pitha u. Billroth, "Handbuch der Chirurgie, 71. S.

² Braidwood on "Pyæmia," p. 168.

³ Ibid., pp. 168, 169.

pus, or caseous matter of a pinkish-white color.”¹ “To sum up—the chief morbid alterations met with in the bones are, congestion, dilatation of the Haversian canals, and cancellated tissue, leading to abscess formation, and the excavation of cavities by the unhealthy pus.”²

Joints.—The pathological lesions of the joints commence with marked congestion of the synovial membranes, increase of the synovial fluid, and afterward the fluid is mixed with pus; these conditions are followed by erosion of the cartilage and ligaments, the former thus becoming separated from the bone. Both the large and small joints are occasionally the seat of morbid changes.

The Glandular System.—Lymphatic glands are only secondarily affected in pyæmia, and even this takes place very rarely. The changes, when observed, are similar to those which happen in the other tissues of the body, viz., congestion, inflammation, and suppuration.

Blood.—The changes in the blood have been so fully detailed in other portions of this article, that it is now thought unnecessary to enter again on the subject. The arteries are usually found empty after death from this disease, and the coats are sometimes apparently thickened. The veins are commonly found, on the contrary, filled, or even distended, with firm fibrinous clots. They are also sometimes found inflamed or altered, although commonly healthy. The distended condition of the veins gives rise to the cord-like feeling often mentioned by different observers. In some cases of phlebitis there may be pus deposited between the coats of these veins. The thrombi are occasionally observed as firm fibrinous clots, but they are frequently found, in the rapidly-fatal cases, to have undergone suppurative changes. These changes begin in the centre of the clots, which often contains true pus, or a greenish puriform fluid.

Pericardium and Pleuræ.—The pericardium occasionally contains a small amount of serum tinged with blood, but is rarely covered with recent lymph. “The pleuræ are generally inflamed in this disease, along with the pulmonary tissue proper. The costal and visceral layers are sometimes found

¹ Braidwood on “Pyæmia,” p. 192.

² *Ibid.*, p. 194.

firmly, even inseparably, agglutinated together by old adhesions. They are, however, more commonly united by recently-formed lymph, which covers more or less of their extent, and is easily broken down. Occasionally both sides of the chest, but generally one only, is the seat of this inflammatory process. The pleural cavities commonly contain some opaque, muddy, sero-purulent fluid mixed with blood and having masses of lymph floating in it.”¹

Lungs.—It has already been shown that the lungs, much more frequently than the other organs, are the seat of metastatic abscesses and other morbid changes in pyæmia multiplex. The theory of their formation and frequency are in complete accord. The following is a summary of the morbid changes in these organs:

Emboli in the branches of the pulmonary veins, metastatic abscesses surrounded with capillary congestion, and other evidences of inflammation. “The smaller vessels, trying to overcome this afflux of blood, may produce ecchymoses or extravasations beneath the lining membrane of the air-vesicles; but these minute capillary congestions are generally observed as red points studded over the pulmonary surface, which by-and-by exhibit yellowish-white or bluish-white centres. While one part, generally the lower half of the lung, is thus hepatized, solid, and of a dark-greenish color, the remainder of the lung is emphysematous, and more or less cedematous. A section of the former presents the same appearance as is observed in the lungs of pneumonic patients. Whether these incipient abscesses are developed from the minute points of congestion aforementioned by the breaking down of some thrombic clot in their centres, or whether the pus is developed out of the serum exuded by the walls of the engorged capillaries, cannot be easily determined, and has as yet not been decided. These secondary abscesses vary in size from that of a hemp-seed to that of a hen’s-egg.”² These are generally situated on the periphery of the lungs and in the lower lobe, although in some cases they are found imbedded deeply in the pulmonary tissue. The contents of these ab-

¹ Braidwood on “Pyæmia,” p. 172.

² Ibid., p. 173.

scesses are similar to those found in other parts of the body in this disease. The bronchial mucous membrane is commonly of a bright pink color, while its secretion is increased in quantity, and may be clear and frothy. These conditions in this membrane are the result of acute bronchial catarrh. The peritoneal cavity may contain an increased quantity of clear or cloudy fluid.

Spleen, Liver, and Kidneys.—Billroth and Sédillot observed pathological lesions involving a solution of continuity in these organs, in the order in which they are mentioned above; other authors, however, assert that the liver, next to the lungs, is the most frequent seat of purulent deposits. Enlargement of the spleen is frequently met with in cases of pyæmia multiplex. The metastatic abscesses found in the spleen and kidneys are much smaller than those found in the lungs and liver, but in other respects are of a similar character. The capillary congestion and the accompanying infarctions require no special attention here. The liver, like the spleen, is sometimes enlarged, and at other times is found to have undergone fatty degeneration to a greater or less degree—in which condition its tissues are generally soft and friable. Abscesses in the liver are so much like those in the lungs as to need no separate description. The same may be said of the other pathological changes found in this organ in pyæmia multiplex. The abscesses found in the kidneys vary from the size of a hemp-seed to that of a bean, and are surrounded by the usual zone, marking, more or less definitely, the extent of the inflammation. The capsule is generally healthy. There are, also, in very rare cases of this disease, abscesses found in the stomach and intestines, involving the thickness of the mucous membrane; and it is further supposed that these abscesses may be found, occasionally, on any portion of the mucous membrane lining the alimentary canal. Post-mortem examinations in pyæmia multiplex have established the fact that there is no organ in the body but what may become the seat of the pathological lesions in this disease; but there is unquestionably a vast difference in the relative frequency of these changes in the various organs. It is now readily observed that the pathological lesions in pyæmia

multiplex are so positive as to render further discussion of the subject unnecessary.

Pyæmia simplex may be readily mistaken for septicæmia, and *vice versa*. In both conditions the pathological appearances are, occasionally, nearly or completely negative. "The materies morbi occasionally induces death ere the local lesions have had time to manifest themselves."¹ I shall now attempt to point out the pathological peculiarities pertaining to each of these diseases, and also mention the important difference in origin, for the purpose of aiding in the determination of the differential diagnosis on the cadaver. I must therefore call attention to the fact that *pure septicæmia* is a disease which owes its origin to the absorption of *septic, not purulent, matter*. In all cases where there is absorption of both septic and purulent matter, the disease is properly called septopyæmia; and should the autopsy reveal the presence of metastatic abscesses, then we would immediately recognize the fact that there had been an absorption of ichorous pus and septic matter; while the non-existence of metastatic abscesses, under somewhat similar circumstances, would certainly imply the absorption of non-ichorous pus and septic matter. Pus is often rendered ichorous by the action of the atmosphere; therefore the pus exposed to this action may be regarded as possessing the power of producing metastatic abscesses. In other cases there may be extensive suppuration while the pus does not, at any point, come in contact with the air; and here the purulent absorption would fail to produce these peculiar lesions—metastatic abscesses—but might produce pyæmia simplex. This subject is further explained under the "Etiology of Pyæmia." The question now arises, How soon after the receipt of an injury, or the performance of an operation, may pus form? Hueter, who has given much time and attention to the study of pyæmia and septicæmia, and who certainly has written the best monograph on this subject ever published in any language, thinks the formation of pus must require four or five days. It therefore becomes probable that, in all cases of blood-poisoning before the lapse of that time, the case is one of pure, unmixed septicæmia; after the lapse of this

¹ Braidwood on "Pyæmia," p. 164.

period there is always a possibility that the case is one of septopyæmia. We have previously mentioned the fact that septic poison diminishes or destroys the coagulability of the blood. Here is the important point in our differential diagnosis on the cadaver. In septicæmia there is at least *diminished* coagulability of the blood. In pyæmia simplex, generally, there is increased coagulability, with the other changes already noted.

Pyæmia simplex must take its origin from the development of pus in the patient's body, or the pus must certainly be brought in contact with a wounded surface. The existence of suppuration in any portion of the patient's body would certainly render doubtful the diagnosis of pure septicæmia. In pure septicæmia there are no purulent deposits to be found on the cadaver. In pyæmia simplex there is a purulent deposit, or deposits, but these are generally excluded from the atmosphere. In both forms of septopyæmia there are purulent deposits, or at least there must be evidence of suppuration having taken place.

(To be continued.)

Clinical Records from Private and Hospital Practice.

I.—*A Case of Retrobulbar Neuritis with only Quantitative Perception of Light, ending in the Restoration of Perfect Vision.* By GEORGE REULING, M. D., Surgeon in Charge of the Maryland Eye and Ear Institute, Baltimore.

MRS. G., of Staunton, Va., was admitted into the Maryland Eye and Ear Institute on the 5th day of May, 1877, with the following history furnished by her physician:

On the 31st day of March last she gave birth to a child. For three or four weeks prior to confinement she had more or less conjunctivitis in both eyes, but no impairment of sight. About a week after parturition the eyes were seized with violent pain to such a degree, that the attending physician was obliged to apply a number of leeches to both temples. This gave great relief, and also restored vision, which

had become somewhat blurred. On the 23d of April, about two weeks later, her vision again became blurred to that degree, that she could from her window only discern the figures of persons passing on the street, not being able to distinguish whether they were white or black. The impairment of vision gradually increased to such an extent, that after scarcely two weeks' time she could not see the motion of a hand.

The treatment she received at home consisted in the application of lotions of lead and zinc, and the internal administration of potassium iodide and bromide.

Since 1870 the patient had been troubled with great excitability of the nervous system, and was subject to occasional attacks of unconsciousness, lasting from ten to thirty minutes, with simultaneous spasmodic contractions of the hands and feet, which her physician very properly ascribes to hysteria—this being one of the family characteristics.

Stat. Pres.—The patient is a lady of full habit and large physique, weighing over two hundred pounds; she is thirty years of age. The respiratory organs, the heart, and the intestinal tract, present nothing abnormal. There is no albumen nor sugar contained in her urine; palpation of her cranium, as well as of her spinal column, yields only negative results.

The pupils, though of the normal size, do not respond to the light. There is no cephalalgia, nor ever has been. Vision is reduced to the faint recognition of the lamp in a dark room, and even that but very imperfectly, the inner and lower quadrant of the field of vision in both eyes being indistinctly defined.

The ophthalmoscopic appearances are almost negative, and not at all in harmony with the loss of sight. The optic disks are slightly hyperæmic, but not beyond the physiological limit, and the margins of both papillæ are somewhat indistinct toward the nasal side. The arteries are slightly attenuated, but the veins offer no abnormal appearance.

It must be remarked, in this connection, that slight hyperæmia of the internal part of the optic nerve-entrance, together with indistinct outline of the corresponding margin, may be absolutely physiological.

Diagnosis.—Amaurosis dependent upon retrobulbar neuritis.

Treatment.—*May 5th.*—The patient was put into a shaded room—*absolute* darkness not being advisable in such cases—and one ounce of blood was abstracted from each temple by means of Heurteloup's artificial leech. Strychnia injections ($\frac{1}{20}$ grain) were begun, and repeated twice a day.

7th.—As yet there has been no improvement whatever; the patient still has only quantitative perception, being able only with great uncertainty to localize the position of the (moderate) lamp in a darkened room. Her pupils do not respond to the light.

8th.—Unguentum hydrargyrum ordered, inunction treatment begun, and the application of Heurteloup continued, together with the diurnal hypodermic injection of strychnia.

9th.—Motion of the hand in daytime, and perfect localization.

10th.—The patient remarks that she "can see the door-knob;" counts fingers in four feet. Field of vision perfect.

11th.—With her right eye she can read Snellen No. 30 in twenty feet; her vision in her left eye is almost one half (Sn. $\frac{20}{40}$ nearly). The pupils act better, but are still slightly sluggish.

The improvement, as above seen, was so rapid, that the patient, being desirous of going home, was allowed to leave the Institute upon the 12th—one week after her admission—with instructions to her brother, her physician, regarding further treatment.

19th.—I received a letter from this gentleman informing me that the patient, after continuing the use of the gray ointment until very slight salivation was produced, the strychnia, etc., was at that date able to see as well as at any previous period of her life; or that, in other words, the eyesight of the patient had been perfectly restored.

Though the etiology of the above case is by no means clearly established, it is fair to presume, in the absence of any other substratum, that there was a metastasis occurring during confinement productive of sufficient changes within the

neurilemma of both optic nerve trunks, or within their immediate vicinity, to cause blindness.

As the anamnesis of the patient pointed to hysteria, and such individuals not unfrequently simulate blindness, in order to silence all doubts, Graefe's prismatic test was employed upon her admission, and the result established that the amaurosis was owing to other causes.

The above case could not have been of uræmic origin. There was no albumen in the urine, no cephalalgia, no languor, no shortness nor want of breath, and the blindness was not suddenly produced (in one or two days). The ophthalmoscopic appearances, indeed, which here also are almost always nil (i. e., in the incipient stages; afterward the picture of retinitis albumenurica is usually produced), or only present a slight haziness of the nerve and the contiguous retina, were almost identical with our case; but, as has been said, the urine of the patient, although repeatedly tested, never at any time showed even a trace of albumen.

Our case does not correspond in all respects, however, with the group called by Graefe retrobulbar neuritides (*Arch. f. O.*, xii., 2, pp. 114, *et seq.*). According to him, the darkening of the visual field, and the consequent loss of sight (with or without subjective color or light sensations), is sudden, occurring in a few hours, or days. In our case, the disturbance of vision began on the 23d of April, when the patient could only distinguish the figures of persons on the street, and was reduced to mere quantitative perception of light within twelve days.

The loss of sight, although very rapid, was therefore less sudden than is usually the case. In every other respect the appearances presented were identical with Graefe's cases, the ophthalmoscope offering the same meagre results, out of all proportion to the great impairment of vision.

It is not at all possible that our case was dependent upon a primary affection of the brain; the perfect restoration (in so short a time), and more especially the total absence of all cerebral symptoms, most strongly contraindicate this assumption. The spasmodic attacks contained in her history never appeared while under observation, and are said to have les-

sened greatly in frequency and intensity during the last few years.

These sudden spells of unconsciousness which the patient is said to have had, lasting from ten to thirty minutes, and being accompanied by a spasmodic contraction of the hands and feet, might, indeed, lead a superficial observer to explain the case by H. Jackson's so-called *epilepsia retinae*.

But this diagnosis would be altogether untenable. Jackson ("Ophthalm. Hosp. Rep.," iv., 1, pp. 15, 16) found his patient to have become suddenly blind, to have remained in this state for five minutes, and then to be restored to undisturbed sight as suddenly as this had been lost. There were no ophthalmoscopic symptoms, and the case is explained as one of transient contraction of the arterial vessels of the retina (Zehender's "*Augenheilk.*," p. 620; Jackson, *op. cit.*, *l. c.*).

It is difficult of explanation why, if uræmic intoxication or neoplasms on or about the chiasma, etc.—which latter usually present the ophthalmoscopic picture of engorged papillæ (descending neuritis: *Stauungspapille*)—are left out of consideration, vision should in our case have been bilaterally affected in the same degree.

According to Rimpler (Zehender's *Kl. Mtsblätter*), this may be accounted for simply by the fact that, like many other eye-diseases, retrobulbar affections of the nerve prefer to appear bilaterally.

In conclusion, it may be said that there was no post-partum hæmorrhage in our case, and no sudden suppression of the lochial discharge, which latter, according to Mooren ("*Ophthalmiatriische Beobachtungen*"), may occasionally explain the appearance of retrobulbar neuritis.

The above case furnishes a valuable addition to the class of "amblyopias without ophthalmoscopic appearances." In the total absence of general causes—as, for instance, blood-intoxication or constitutional changes, cerebral or spinal disease—we are forced to diagnose a primary neuritis optica, which, being situated at some distance from the eyeball, does not alter the image obtained by the ophthalmoscope sufficiently to permit a direct perception of the morbid process.

In fact, a nerve, as Leber has shown ("Ophth. Congress at Heidelberg," 1868), when examined *macroscopically*, may appear to be altogether normal, and yet under the microscope may present considerable pathological changes. This being the case, it is evident that the ophthalmoscope will not be able, in every instance, to detect changes sufficient in kind and degree to explain certain forms of almost total blindness, inasmuch as the process may take place in that part of the nerve which is hidden from view—that is, the nerve-trunk.

II.—*Congenital Phymosis, with Adhesion of Foreskin.* By
N. A. ROBBINS, M. D., Surgeon to Brooklyn City Dispensary.

MR. II., Swede, aged about fifty, applied to me for a difficulty in passing his urine. Upon examining his penis, I found that he could only pass his urine in drops, and that it was continually dribbling away. A small probe could not be passed into the meatus, down to and into which the foreskin seemed to be entirely adherent to the glans. The patient stated that this condition had always existed, but as he has had two children, now eighteen or twenty years old, the adhesions must have progressed considerably in extent since the time of their conception, as at the time when the patient came under my observation impregnation could not have been effected. Under these circumstances, circumcision—an operation attended with much more difficulty than usual—was indicated, and was performed as follows. The patient having been fully etherized, an attempt was made to pass a director from the meatus backward, between the glans and the foreskin, but the adhesion was so general and firm that this could be accomplished at only one point, and here the instrument seemed to pass so deeply from the external surface, that a false passage was suspected, and afterward found to exist, leading quite down to the base of the glans. An incision was therefore made directly over the corona glandis and continued forward to the meatus, the adhesion of the foreskin being found complete in its whole course. A further incision was then made around the whole base of

the glans, and the foreskin dissected off, leaving its mucous layer firmly adherent to the glans at every point. The attempt at dissecting this off—since it yielded only to the edge of the knife, and it was impossible to avoid scratching the abnormally delicate mucous membrane of the glans and causing a dangerous amount of irritation and bleeding—was given up, and the patient directed to report next day. On seeing him again, I cauterized with nitrate of silver the whole surface of the dissected parts covering the glans penis, and ordered poultices. Under this treatment the mucous membrane sloughed off in two days, leaving that proper to the head of the penis cleanly exposed and in good condition. This case seems interesting on two accounts: Such an amount of adhesion is believed to be rare, as a considerable search through standard works on general and special surgery discovered no report of any such condition, most of the authors merely saying that there may be more or less adhesion between the prepuce and the glans—in this case, there certainly was more. Dr. Bumstead, in his work on “Venereal,” speaks of a case recorded in the “Surgical Register of the New York Hospital,” in which Dr. Stevens removed the free portion of the prepuce, which was found to be attached to the margin of the meatus instead of to the base of the glans, and formed a tubular prolongation of the urethra nearly an inch in length. This is the nearest approach to the condition in my own case that I have been able to find. The other point of interest is the efficiency of the caustic in the destruction of the mucous membrane of the prepuce remaining on the glans, the result upon which, of course, depended the success of the operation.

III.—*Notes of a Peculiar Case of Hysteria.* By JOHN A. WYETH, M. D.

Miss L., aged sixteen years, consulted me in January, 1877, about her eyes; was myopic, and relieved by adjustment of proper glasses.

Three weeks after this patient was suddenly seized with convulsions. Arriving at the house, I found her in a condition

of marked opisthotonus, the jaws clinched so tightly that it was impossible to open the mouth, the posterior muscles of the neck and the muscles of the back being in a tetanic condition. The spasm would last for about five minutes, then an interval of complete relaxation for about the same time, succeeded by a new period of muscular fixation. Temperature $99\frac{1}{2}^{\circ}$, pulse about 100, respiration not taken on account of spasmodic interruption. I was positively assured by the family that there was no strychnia in the house, in any shape, nor had she had any prescription for any. It could not be traumatic tetanus, since there was no injury, nor were the muscular fixations long enough for regular tetanus. Prescribed chloral in large doses, to be continued during the night, in quantities sufficient to quiet the patient.

Fifteen hours after, spasms longer apart, and not so violent; patient delirious, showing marked preference for the opposite sex. Her remarks, when suddenly interrupted by the opisthotonus, were resumed exactly at the point where the break was made, and concluded as though no interruption had occurred. She evidently did not appreciate the interruption.

Found out that she had never menstruated. Took advantage of one of the convulsive attacks to ascertain the condition of the generative organs, which were found to be well developed, the vagina being unusually capacious for one of her age. Not the faintest trace of a hymen.

Ordered patient to be given a warm hip-bath and warm vaginal injections, at stated intervals, for two days. Emmenagogue prescribed at the same time.

At the end of several days of this palliative treatment, the menstrual flow not being established, with the assistance of Dr. Henry W. Weiss, the patient was placed under the influence of ether, the speculum introduced, and an attempt made to introduce a probe into the uterus. The os uteri was perforated, but at about three-quarters of an inch from the external os the instrument was arrested in its passage. A bistoury was then slid along the probe, pushed through the obstruction, in the direction of the cavity of the uterus, and the entire sides of the cervix were incised freely to maintain the opening

of exit. There was no escape of blood or other fluid, more than would naturally flow from the incision made. The probe was again introduced, and passed freely until it struck the fundus of the uterus.

Patient was put to bed, ordered continuation of previous treatment, and improved rapidly. The convulsions recurred, at rare intervals, for the next two or three weeks, but were very mild, and, at her next menstrual period, the discharge came. The convulsions ceased entirely, and have never returned; and, what is to me the strangest feature of the case, the myopia has disappeared, the patient of her own will having discarded the glasses.

Points thought to be of peculiar interest:

1. Convulsions of *hysteria* simulating *strychnia-poisoning* and *tetanus*.

2. No evidence of retained menses, although the convulsions ceased when the cervix uteri was opened and the discharge established.

3. Defective vision relieved by the establishment of the catamenia.

ART. IV.—*Sixty Cases of Poisoning by Arsenic.* By J. H. FINLEY, M. D., Streator, La Salle County, Ill.

ON Monday, May 14, 1877, at two o'clock, I was called in great haste to No. 2 Shaft, Streator, a quarter of a mile from my office, to see a number of sick men that were coming up from the bottom of the shaft. The messenger informed me that they were vomiting, and in great pain. I immediately went with the messenger, and, upon my arrival at the shaft, found twenty men already up, and more coming. I made an examination, and found, as I believed, that they had been poisoned by arsenic. The symptoms commenced within a half to three-quarters of an hour after eating dinner. They had faintness, nausea, and incessant vomiting, with a burning pain in the epigastrium, increased on pressure, and gradually extending over the whole abdomen, followed by headache and severe diarrhœa, with a sense of constriction and heat in the fauces and throat, great thirst, and in some painful respi-

ration. Pulse quick and very feeble, from 100 to 180; cold, clammy skin, with very severe cramps in the legs in those who had severe diarrhœa. Some of the men had tumefaction of the penis. The above symptoms were found in all of the sixty men—in some more severe than in others. I immediately gave large doses of the hydrated sesquioxide of iron (and sent for assistance, as there were so many patients), and repeated the medicine every time they vomited; they vomited very freely with a few exceptions. This treatment I continued until five o'clock that evening.

Some of the men were collapsed; to those I gave diffusible stimulants. A great many of the men had severe cramps in their legs until eleven o'clock at night, and some little pain in the abdomen for several days. Ten of the men had slight gastritis. One man had and still has paralysis of the left arm and leg, and the sensibility of the skin is impaired; he complains of coldness in his limbs.

By May 23d they had all so far recovered as to be able to move to a town sixty miles northeast of Streator.

Notes of Hospital Practice.

BELLEVUE HOSPITAL.

SERVICE OF DR. CHARLES PHELPS.

Incised Wound of Penis; Septicæmia; Death.—A patient was admitted to hospital suffering from an extensive incised wound of the penis. There had been very free hæmorrhage after the injury, and it was found necessary to tie an artery after being received into the ward. There was considerable shock from loss of blood; but reaction set in after a short time. On examination, it was found that the incision had passed through the corpora cavernosa and urethra, leaving intact an inch and a half of the integument and greater part of the corpus spongiosum. It was decided to save the penis if

possible, and for this purpose a catheter was introduced into the bladder and the edges of the skin and urethra brought together by sutures. For three days the parts retained their vitality and did well, but on the fourth day the catheter became closed with phosphatic deposit. While endeavoring to remove it, the patient made a forcible effort, and expelled his urine along the outside of the catheter and through the wound. On the day following this untoward accident, the penis became gangrenous, and had to be amputated. No bad symptoms appeared for four days, but at the end of that time the patient suffered from a succession of chills. At the same time pain was complained of in one of the legs below the knee, followed by blueness of the foot on the same side. Two days subsequently the patient became comatose, and died within three hours. There was no convulsion. Previous to death the foot became normal.

Post-Mortem.—The kidneys were found congested. The spleen was disintegrated, but not enlarged. The liver was enlarged. Heart normal. The mucous membrane of the bladder was congested. No abnormality was detected in either the foot or leg which gave unpleasant symptoms during life.

Penetrating Wounds of the Abdomen.—Several cases of penetrating wounds of the abdomen have been under observation in the surgical wards. In one case a portion of the omentum escaped, but was returned. In each case peritonitis occurred, but ended in recovery.

Rupture of Kidney; Fracture of Pelvis.—A man, while engaged upon a roof, fell and sustained a severe injury. Shortly afterward he was transferred to hospital, and on examination it was found that he could be only partially roused from the shock. The only external injury at first noticed was a compound fracture of the radius. A catheter was introduced into the bladder, and a small amount of blood withdrawn, but no urine. A more thorough examination was then made, when there was found a fracture of the crest of the ilium. Warm applications were applied to the injured pelvis. Twelve hours after the injury the patient died. The shock continued throughout, and, although a hot-air bath was

used with intention of rallying the patient, no benefit was obtained.

At the autopsy a large clot of blood was found in the region of the kidney on that side in which there was fracture of the pelvis. An examination of the clot showed that the kidney had been ruptured in its longest diameter. The other kidney was anæmic, but not apparently diseased. It was difficult to understand how, with one kidney normal, no urine should be secreted after the injury. The most satisfactory explanation would be that the suspension of the function was due to the shock.

SERVICE OF DR. E. L. KEYES.

Penetrating Wound of Knee-Joint; Suppurative Synovitis.—A case of incised wound of the knee-joint was placed under treatment, and was important in showing how grave results may follow injury to the joint. The history obtained from the patient was that he had been stabbed in the knee, and previous to being admitted had the wound closed by sutures. On admission the wound presented a healthy appearance, but there seemed to be indications of synovitis. These became more pronounced, and after three days suppuration of the joint became evident. The condition of the patient would not warrant exsection. It was, therefore, proposed to amputate at the lower third of the thigh, in order to check the drain on the system, which resulted from the extensive necrosis of the bones forming the joint. Consent to the operation could not be obtained, and at the present time—two months after the injury—the condition of the patient is such as nearly to preclude recovery.

CHARITY HOSPITAL.

SERVICE OF DR. JOHN J. REID.

Carcinoma of the Œsophagus; Difficulty of Diagnosis.—A female patient, aged sixty, entered hospital, giving the following history: Some few months before admission she began

to lose flesh, and shortly afterward began to suffer from protracted vomiting, with pain in the region of the epigastrium. These symptoms continued without much change up to her death, which occurred about two months after entering hospital. An examination of the patient revealed a tumor in the region of the stomach, and, when considered in conjunction with the malignant history furnished by the patient, left but little doubt in regard to a diagnosis of cancer of the stomach. The patient was examined closely in respect to the vomiting, mainly with the purpose of deciding whether stenosis existed at the cardiac or pyloric extremities. As far as could be made out, vomiting usually occurred in fifteen or twenty minutes, and it was then supposed that an obstruction existed at the pylorus. Death took place from exhaustion, and at the autopsy it was found that no cancer of the stomach existed. A carcinomatous tumor was found at the lower portion of the œsophagus, which caused the cardiac orifice of the stomach to be contracted to such an extent as barely to admit a lead-pencil. The tumor which was made out over the stomach proved to be the pancreas, which projected upward. The case would not have been so interesting had not special attention been directed to the existence of stenosis. The tumor which proved to be the pancreas, was decided to be cancer of stomach, after excluding fecal accumulations in the colon, and aneurism of the abdominal aorta. The true condition of the patient was not even suspected.

Aneurism of the Left Subclavian Artery.—A patient, aged fifty, was admitted, giving an indefinite history. On examining the chest, nothing special was detected; but, on placing the ear above the clavicle, a decided aneurismal *bruit* was made out. Below the clavicle no sign of aneurism could be heard. When the finger was pressed behind the clavicle, there was a distinct purring thrill, and on examining the radial arteries a marked weakness was felt in the left. The aneurismal *bruit* was confined to a small area, and, had not the ear been placed behind the clavicle, it is questionable whether a diagnosis would have been arrived at.

Clinical Reports of the Demilt Dispensary.

DEPARTMENT OF DISEASES OF THE SKIN.

BY DR. L. DUNCAN BULKLEY.

CLINICAL NOTES ON SYPHILIS.

Seven Cases of Palmar Syphilis.—When affecting the palms of the hands and the soles of the feet alone, syphilis is so commonly mistaken for other diseases that a brief mention of seven cases which have been under treatment during the past year may not be without interest and profit. It is well known that palmar eczema and psoriasis may simulate the eruption caused by syphilis so perfectly that it is often a matter of great difficulty to make the diagnosis from the appearance of the eruption alone. Several of the cases here reported had long passed unrecognized, one of them having been twice in a hospital, for periods of three and six months respectively, without the true nature of the affection having been recognized, the treatment being purely local, and no investigation of the constitutional nature of the disease being made; and, moreover, the effects of all previous treatment had been but moderate and transitory.

The lesions of syphilis may appear upon the palms and soles either early after infection, or as one of the very late manifestations of the poison (I have observed it there as late as twenty years, as far as could be made out, after the disease had been acquired), and the cases present somewhat different appearances, according as the eruption is one of the early or late symptoms of the disease. In the earlier cases the lesions are apt to be multiple, as all the earlier manifestations of syphilis, whereas eruptions on the palm or sole late in the history of syphilis partake more of the nature of the later lesions, and are more commonly single. These seven cases may be thus divided, and I will mention first the three in whom the palmar and plantar exhibitions of syphilis occurred early in the disease.

CASE I.—Joseph Kelly, aged thirty-three, came to Demilt, February 27, 1877, saying that he had had a chancre on the

penis four months previously, which was followed, at the expiration of about a month, by a general, scattered, papular eruption. Examination revealed the remains of a chancre at the end of the meatus; there was somewhat of a depression and some hardening still remaining, with moderate inguinal adenopathy.

The centres of both palms were the seats of a distinctly tubercular and squamous eruption, with well-defined margins passing abruptly from diseased to healthy tissue; the patches were about an inch and a half in diameter, and nearly circular. On the feet there was a similar eruption of flattened, scaly tubercles, disposed in a more or less circular form, about in the centre of each sole. The color of the eruption was of a dark red where the outer layers of epidermis were gone, but, where this still was intact, they had a dirty-yellow look, with punched-out edges. There had never been any moisture, and little if any itching. There was still some of the general eruption to be seen on the legs, and some superficial redness of the fauces existed.

He was put under the use of mercurial inunctions into the sides and thighs, with no local treatment, and on March 1st it was noted that there had been very great improvement in the eruption everywhere. He continued to improve, but after some weeks became careless, and returned on April 14th, after an absence of three weeks, with the eruption worse. On May 5th a sclero-choroiditis was discovered.

He continued under treatment for some weeks longer, and the eruption nearly disappeared, when he again failed to attend, and has not been seen since.

CASE II.—A woman, J. H., aged forty-three, acknowledges to having had sores on the vulva in March, 1875, which were soon followed by a general eruption, the palms being affected at the same, or about the same, time. She has been in attendance at the Dispensary nearly a year; she has a family, and as soon as the hands improve to a certain point she always neglects treatment, and returns when they give her annoyance.

In her case the eruption occupied the palms of both hands, being made up of isolated tubercles, somewhat elevated, fissured here and there with a small amount of scaling. The

edges of the eruption, which were made up of separate papulo-tubercles, in some places touching each other, were sharply defined, as if punched out, and, on raising the epidermis, which was loosened from the inner border, it was seen to run externally down into healthy tissue beyond the eruption.

She was given a mixed treatment of bichloride of mercury and iodide of potash, with no local measures, and the improvement was very prompt and decided, but, like so many of these patients, attendance became irregular as the disease gave less trouble, and at the last note, May 24th, there were still some traces of the lesion, in the way of a few small fissures where former tubercles had been.

This woman has five healthy children, born before the occurrence of the chancre.

CASE III.—This patient gives no history of infection, but the appearance of the eruption on the palms is that of a more recent syphiloderm, and the following history of her pregnancies confirms this. She has been married twice and had twelve children by her first husband, and none by the second; all the children came to full term except one which miscarried at three months, the cause of which she attributes to fright. All the children are healthy but one, who is under treatment for eczema of the leg.

Her name is Sarah McK., aged fifty-one years. When first seen both palms were the seat of eruptions corresponding mainly in appearance to those described in the two preceding cases. On the right palm there was a clearly-defined, irregular patch about one by one and a half inch in diameter, seated at the roots of the two middle fingers. On the palmar surface of the left hand there were three distinct patches at the roots of the last three fingers. She was given inunctions of mercurial ointment into the sides and thighs, and improvement resulted, but she also was careless, and the case was not followed to the end.

The following cases are instances of the eruption of syphilis occurring on the palm and sole later in the disease.

CASE IV.—Ann McC., aged twenty-nine years, has every appearance of health, with the exception of the single lesion on the right palm, which, when she first came for treatment

(October, 1876), almost incapacitated her for work ; the disease occupied the larger portion of the internal surface of the hand, including the fingers and thumb. Most of this surface was bereft of epidermis, was of a deep, purplish red, the larger part of it smooth and shiny, with here and there separate or grouped tubercles, on which the new epidermis was beginning again to harden and peel ; where these tubercles existed at or near flexures, there were cracks, which were very painful. The margins of the eruption were very clearly defined, punched out in appearance, with the edges of the epidermis everted, and when this was pulled on toward the healthy tissue it could not be separated without giving pain. On close examination the greater part of the margin could be recognized as composed of separate tubercles arranged side by side, in some instances running into each other, at others quite isolated.

Her history was perfectly conclusive of the nature of the disease: her first husband confessed to having syphilis, and ten years ago she became infected and had the usual phenomena, obstinate sore-throat, loss of hair, occipital headache in the afternoon, and three miscarriages at two, three, and five months respectively, followed by a dead child at full term, and two other children which lived but a few weeks, and had eruptions which, from the description, were syphilitic. The syphilitic lesion on the palm did not appear until three years before her visit to me, or *seven years* after she acquired the disease.

She was placed upon a mixed anti-syphilitic treatment, and made very great improvement without any local measures ; subsequently, however, these were added to expedite the cure and to counteract the effect of her occupation. She also was rather fitful in attendance as the hand approached a cure ; and at the last note, June 14th, there were still some remains of isolated tubercles, although the hand has long ceased to give her any great annoyance. She was obliged to do household work and washing most of the time while under treatment, which delayed the recovery greatly. I may mention, in this connection, that another patient treated some time ago, who was a silver-plater, and obliged to keep the hands in acid much of the time, recovered completely and remained well of a pal-

mar syphiloderm, he taking only the mixed treatment internally, with no local measures whatever.

CASE V.—Mary D., aged sixty, a widow woman, has always enjoyed good health until a year ago, when, as she states, after smoking the pipe of a boarder, she acquired a general papular eruption, which was preceded by a sore-throat, and followed by sore eyes and falling of the hair. When first seen, June 9, 1877, the eruption was confined chiefly to the left hand, the right being entirely free. The lesion occupied an elliptical surface, extending from a little below the wrist, over the ball of the thumb, around to the roots of the fingers and along the ulnar border of the hand, joining the starting-point just above the wrist; the centre of the palm appeared free. The eruption was made up of tubercles, slightly raised above the level of the skin, which in some places touched and coalesced; there was considerable loss of the epidermal layer on the affected portions, with sharply-cut edges.

On the radial side of the left arm near the elbow, also on the right forearm, and on the back of the left hand, were the remains of a papulo-tubercular eruption, of dark-red color, and on the anterior surface of the right leg were brownish stains of a similar lesion. She was placed upon a mixed treatment with immediate improvement to the eruption, no local measures being employed.

CASE VI.—James McK., aged fifty years, gives no history of contagion, the first lesion of syphilis which he acknowledges to being the present eruption, which he says came first a year and a half ago; the palmar lesion appeared to be but a portion of the papulo-tubercular eruption existing elsewhere. On the upper surface of the right foot, extending around on to the tendo Achillis, also on both legs, and to moderate extent on the arms, there was an eruption disposed to a great extent in the form of circles and gyrations, composed of flat papulo-tubercles, in many instances touching each other, in others isolated, of a deep, coppery-red color, and with but moderate scaling. On the right palm was an eruption composed of the same elements, and exhibiting characteristics corresponding to those previously detailed, which need not be repeated, as the lesion presented nothing unusual. He was seen but once.

CASE VII.—James Higgins, aged forty-two, a laborer, appeared at the Dispensary first on January 27, 1877, for the treatment of an affection of the sole of the foot, which had lasted a year and a half. He is a man of more than ordinary intelligence for his class and occupation, and denied having had syphilis, and was much surprised when the disease was confidently ascribed to this cause; he gave no history of syphilis as far as could be made out.

On the middle of the sole of the right foot there existed an irregularly-shaped patch, with circular edges, of diseased tissue, from which most of the normal epidermal covering was gone. On close examination it was seen to be composed mainly of separate elements, irregularly placed, which presented themselves as papular or small tubercular prominences, with a dirty-grayish epidermal covering. The margins of the patch were very clearly defined and sharply cut, the epidermis standing up at the edge, and when pulled on the layer was found to reach down into healthy tissue peripherally.

For the purpose of clinical study, the case being carefully watched by a number of medical gentlemen attending the clinic, he was given only mercurial ointment, for inunction into the sides and thighs, with no local application whatever. The patch fairly melted away under the anti-syphilitic treatment; in one week, on February 3d, it was recorded that there was great improvement; on March 3d it was noted that the eruption was nearly gone; and on March 13th, or six weeks from the first visit, the record reads that there was only staining left; the patch had existed one and a half year previously.

Remarks.—There are many points of interest in these cases which can hardly be touched upon in the present limits. The eruptions all presented much the same character, except that, in the cases in which the lesion occurred earlier in the disease, there was generally a multiplicity of affected points, while after the lapse of a few years the poison showed itself, as is so commonly the case, at single portions at a time.

The eruptions all possessed points which should, to one familiar with the subject, distinguish them very clearly, and

certainly from eczema and psoriasis, the only two affections with which they could possibly be confounded. The history of the case is, of course, often of great service, but not infrequently, as in Case VII. especially (and often it has occurred in private practice), no sufficient confirmation is obtained from this source, and we must depend solely on the clinical features.

From *eczema*, then, the eruption would be differentiated by the absence of all thickening and itching, also of moisture, which, although uncommon in eczema of the palm, does sometimes occur. Moreover, somewhere around a patch of eczema of the palm, you will find papules, or deep vesicles, or the remains of them, whereas here, whenever the elementary lesion was discoverable, it was a larger papulo-tubercle, of a dark-red color. The margins of eczematous patches are never so clearly and sharply cut as in the syphiloderm, it being a clinical feature of all eczemas that the border between healthy and diseased tissue is never accurately determinable. The surface of the eruption differs materially from that exhibited in eczema; in the latter there are far more apt to be painful fissures of some size, with thickened edges; here they are rare; in eczema the epidermal layers are more adherent than here, where they fall very shortly after they have been undermined by the syphilitic new deposit. The syphilitic lesion is very apt to heal in the centre, while the reddened, slightly-raised border, with its sharp-cut, outer epidermal edge, advances peripherally; in eczema the borders generally get well first.

From true *psoriasis palmaris* this lesion has points of difference, which, although less definite than those separating the scaly syphiloderm and eczema, are nevertheless worthy of bearing in mind, and of clinical value. It will be noticed that I apply the term scaly syphiloderm to the syphilitic lesion under consideration, speaking of psoriasis palmaris as a distinct and separate disease. This position is a very important one for all to take who seek accuracy in medicine, namely, not to use the name of one disease adjectively to qualify another with which it has no possible relations; it is a great nosological error in medicine to speak of syphilitic lupus,

acne, eczema, psoriasis, etc., simply because the particular lesion of syphilis is supposed to resemble these diseases.

Psoriasis palmaris then, first, is a very rare disease; but very few cases have ever presented themselves to my observation; some authors claim that it never occurs separated from psoriasis of the rest of the body: if this latter is true, which I am almost inclined to believe, we have at once a very valuable diagnostic mark. Moreover, when psoriasis appears on the palms and soles it assumes more the appearances presented on the rest of the body, modified, of course, by the very thick, dense, and tough epidermal covering peculiar to the situations. It generally shows several moderately small circular patches, which increase in size by extending each one peripherally, and not by the accession of new separate tubercles added externally, as in the lesion of syphilis. The epidermis over true psoriatic patches in these situations generally adheres pretty firmly, and when removed the base is not elevated as in the syphiloderm, but there is rather a depression—that is, the condition is dependent directly upon the pathological condition causing it; in syphilis the new formation leads to the death of the superjacent epidermis, while in psoriasis there is no new formation, but simply the enlarged and lengthened papillæ and the vascular dilatation, and the epidermis appears simply to be imperfectly formed, and consequently to be shed. The lesions in psoriasis palmaris are multiple as a rule, that is, several small patches on each hand; whereas syphilis in its later stages almost always affects but one spot, and when in its earlier periods both palms or soles are affected the lesion is generally larger and not multiple. Palmar psoriasis not infrequently itches.

In regard to the treatment of these cases, local measures undoubtedly do considerable good in certain of them, and in Case IV. materially assisted the cure. These patients were, however, generally given constitutional remedies alone, that those attending the clinic might observe the results, and also because it was believed to be most advantageous to the patient to attack the disease proper, especially because, as soon as local benefit was obtained, they were always ready to neglect the internal measures. In Case VII., where the single lesion on

one sole disappeared very rapidly and perfectly under mercurial inunctions to the side alone, is shown the complete control which mercury has over the disease. Where the eruption existed on the palm, and mercurial frictions were made by the patients themselves, we have, of course, the combined effect of the local and constitutional effect of the mercury. The oleate of mercury, well rubbed into the palms, is an efficient remedy which I have used, but not in any of the cases here recorded.

Proceedings of Societies.

AMERICAN ACADEMY OF MEDICINE.

Annual Meeting, September 11, 1877.

Improvement in the Preliminary Education of Medical Students.—The American Academy of Medicine convened in the rooms of the New York Academy of Medicine, in order to prosecute the work of endeavoring to raise the grade of preliminary education of medical students. The Academy had its origin last year at Philadelphia, and, although now but in its second year, shows much vitality. Dr. E. H. M. SELL welcomed the Fellows to New York, and said that it was much to be deplored that at the present time so little preparatory education was possessed by many medical students. It could not be said that there was any dearth of physicians, for according to the census there were in the United States 62,383, or one to every 618 of the population. In France and England there was one to every 200.

The President, Dr. T. GREEN, of Easton, Pa., devoted his address mainly to the subject of medical education in this country and in England. He referred to the regret that was expressed by many in England in regard to the entrance into the profession of students not sufficiently trained in general education, many of whom should be turned back and not allowed to pass on to medical graduation. He was of the opinion that, if such a condition of affairs existed in the old

country, to a greater extent did they obtain in America. The President said that for some years he had been an examiner of candidates applying for admission as army-surgeons, and the papers presented betrayed a marked deficiency in orthography as well as an incorrect and confused idea on medical matters. He was of the opinion that the study of medicine required the intellectual powers to be thoroughly trained, and such training was best obtained in the scheme of studies followed out in literary colleges. The effect of such training was to widen the scope of the mind, and make the practice of medicine a liberal profession. The reason of the low grade of many in this country was due, in great part, to the rivalry of medical schools; but it was true that at the close of the war many were thrown into the profession who were deficient not only in general but in professional education. The hope in the future rested in the profession itself, for it was very questionable if much could be hoped for from many medical colleges.

Dr. STINER said that in this country we suffered greatly from a desire to accomplish things too quickly. This was observable not only in medicine, but in other branches of learning, and as a result of this rapid method of acquiring knowledge came superficiality. In a superficiality of knowledge quacks and quackery became more common and thrived. The effect of the rival schools, so prevalent all over the country, was to graduate men in a short space of time, and, of course, without a thorough knowledge of the subjects which are essential to them as physicians.

Dr. Stiner made a strong plea for the study of languages, as an important element in the preliminary education of students. His reasons were, that it trained the faculties and served as a valuable discipline to the mind; it also served as a means of acquiring knowledge not obtainable in our own language. Another very important advantage that it possessed was, to render the individual more catholic, inasmuch as it enlarged the views and killed prejudice by rendering the student more cosmopolitan. It elevated him above petty jealousies, and widened the sympathies for humanity.

Bibliographical and Literary Notes.

ART. I.—*A Text-Book of Physiology*. By M. FOSTER, M. A., M. D., F. R. S., Prælector of Physiology, and Fellow of Trinity College, Cambridge. London: Macmillan & Co., 1877.

WE have inadvertently omitted to mention this excellent treatise until it has become so well known to the profession as to need no introduction. It is not too late, however, to direct attention to the features of the work which distinguish it from other text-books on the same subject.

In the first place, it is not elementary, but is intended for the use of students already somewhat advanced. It does not pretend to give all the views, conflicting or accordant, of other authors, but aims at an explanation of the "main facts and fundamental principles of physiological science." The author says in his preface: "In physiology, as in other sciences, there is a zone of strife where truth and error mingle in conflict, and where the results of yesterday have power because they are new. But in physiology, no less than in the other sciences, this agonosphere is merely the envelope of a solid nucleus of acquired truth, which year by year grows larger at the expense of its more fluid and gaseous wrappings." The object of the author is to present as far as may be that which is fixed and sure, and to guard the student against perplexity and bewilderment. This task has been fulfilled, it appears to us, with remarkable ability and discrimination. The work includes much that is original, and the style is evidently that of an accomplished and enthusiastic teacher.

ART. II.—*The Physician's Visiting-List for 1878*. Philadelphia: Lindsay & Blakiston.

THIS excellent and convenient pocket-book has now been published regularly for twenty-seven years. Each year some slight improvement, suggested by experience, has been made, until the work has become as nearly perfect as possible. It is certainly the most popular visiting-list extant.

ART. III.—*Classified List of Works on Medicine, Surgery, and the Collateral Sciences.* Philadelphia: Lindsay & Blakiston, 1877.

WE notice in this catalogue of standard medical publications a considerable reduction in the retail price of many of the works in greatest demand.

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No. XI.

By GEORGE M. LEFFERTS, M. D.,

CLINICAL PROFESSOR OF LARYNGOSCOPY AND DISEASES OF THE THROAT, COLLEGE OF PHYSICIANS AND SURGEONS; LARYNGOSCOPIST TO ST. LUKE'S HOSPITAL, ETC.

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1. On March 15th of this year the operation of complete extirpation of the larynx on account of carcinomatous disease of the organ was successfully performed by Kosinski in Warsaw. The operation being one of great interest as well as rarity, and in the present case so successful, we do not hesitate to give a translation of the original article, describing its steps and results in full. The present constitutes the tenth case of extirpation which has been performed within the last four years upon the living subject. Seven of these cases have been fully described in the various medical journals (one by Billroth; one by Heine; two by Maas; one by Schmidt; one by Bottini; one by Langenbeck); two have received but a short notice, no detailed account of them having as yet appeared (one by Billroth, and one by Schönborn). Of partial extirpation or resection of the larynx we have only two cases recorded in literature (Heine and Sklifassowski).

The case treated by Kosinski, the last which has been placed upon record, is narrated by him as follows: The patient, a woman, aged thirty-six, mother of four children, was received in the surgical clinic in April, 1876, with all the symptoms of marked stenosis of the larynx. She stated that her throat-trouble dated back one year, and ascribed it to exposure and cold; that it had rapidly increased until her present condition of urgent dyspnoea and absolute aphonia had been reached. The difficult respiration and the overhanging epiglottis rendered a laryngoscopic examination impossible. External inspection of the larynx furnished nothing essential—pressure over the crico-thyroid space was painful. On the following day a high tracheotomy was performed, the operation being followed by great improvement in the respiration, and rapid change for the better in the patient's general condition—so much so, that a few weeks later the patient left the clinic, still, however, wearing the canula, without which respiration was impossible. Ten months later (February 22d) the patient was again admitted to the clinic, in the following condition: great emaciation; atrophy not only of adipose tissue, but muscles as well; difficult deglutition; swallowing of solid food impossible. She breathed alone through the canula; if this be closed it is easily proved that no air can pass through

the larynx; voice is toneless, aphonic. She coughs frequently, but no morbid process can be detected in the lungs. In the median line of the neck, between the hyoid bone and the tracheal wound, a fungoid tumor six centimetres in diameter has developed, presenting all the appearances of an epithelial cancer. It has a dirty, reddish-gray color, and shows, on account of numerous furrows, a lobulated appearance. In its middle is a depression, through which a sound passes into the larynx, causing cough. Lifting the swollen edges of the fungoid tumor upward, its pedicle is found to be of considerable thickness. Through the tracheal wound after removal of the canula nothing can be seen of the tumor in the interior of the larynx. The finger passed through the mouth felt the epiglottis to be thickened and smaller than normal, but with a smooth surface. The enlarged larynx pressed closely against the posterior pharyngeal wall, and could not be pushed forward, a fact which readily explained the difficult deglutition. An examination of the internal organs gave nothing of importance. Heart, liver, and spleen, normal; no albuminuria. The great inanition and the incomplete nutrition of the patient threatened death from starvation; the only means of safety lay in the complete extirpation of the larynx, together with the external neoplasm. The patient consenting, the operation was performed March 15th, as follows: She was placed upon the operating-table with the head slightly elevated by means of a cushion, the trachea was closed with a Trendelenburg's tampon-canula, which had been introduced two days before the operation in order to accustom the patient to its presence. After chloroform-narcosis was complete, two incisions through the skin and fascia, encircling the outer tumor, were made, reaching from the middle of the hyoid bone, on either side, until they ended close to the tracheal opening. The anterior and lateral walls of the larynx were now found to be covered with a thick layer of cancerous tissue, completely infiltrating the sterno-hyoid, sterno-thyroid, and thyro-hyoid muscles as well. This circumstance rendered the laying bare of the laryngeal cartilages more difficult. At the posterior edges of the thyroid cartilage the operator began with the aid of a knife, but more especially with a *raspatorium* (blunt elevator?), to loosen the soft parts from the larynx. The thyro-hyoid membrane was completely degenerated and changed into a friable mass, which was cleared away by means of a sharp, spoon-like instrument. The knife was now passed, for the first time, between the hyoid bone and the thyroid cartilage, and (the epiglottis being left intact) the larynx drawn forward and away from the pharynx with a sharp hook; arriving at the lower edge of the cricoid cartilage it was cut from the trachea, and in this way the whole larynx, loosened from all its attachments, removed. The epiglottis was then seized with a hook, drawn forward, and completely cut away as well as a portion of the palato-pharyngeal arch found to be degenerated. Both sterno-cleido-mastoid muscles were laid bare to a great extent—especially the left, the surface and outer edge of which, being infiltrated with cancerous material, was removed, thereby increasing markedly the size of the operative wound; three vessels alone needed ligature during the operation—two branches of the superior thyroid artery and one of the pharyngeal; the bleeding was unimportant, the operator states, because he took great care to keep always near the cartilaginous parts. After the operation, which lasted one and a half hour, the patient was much exhausted; by means of an œsophageal tube she was given two glasses of wine, and later a cup of milk; the wound was dressed with boracic acid compresses, and the patient, still with the trachea tamponed, removed to bed. On the third day the tampon was removed, leaving the canula; there was no secondary hæmorrhage.

During the operation an accident occurred, easily remedied, but which

might have caused serious consequences. The respiration suddenly ceased in spite of violent inspiratory efforts, and the pale countenance of the patient became livid: thought was instantly given to the closure of the canula-opening by a slipping downward of the rubber tampon; removal of the tampon caused the patient to breathe easily again, and the operation proceeded without further incident.

During the first four weeks the patient was fed either through the œsophagus-tube, or by nourishing injections; attempts to give food by the mouth failed, all passing through the wound; and it was not till four weeks later, the wound meanwhile having become very much smaller, that liquid food taken into the mouth could be swallowed; less and less passed the wound, so that now, one month after the operation, the patient is able to swallow both solid and fluid food. Three weeks since the patient was furnished with Gussenbauer's artificial larynx, and it answered so well that the patient easily bore it, and immediately spoke tolerably loud and distinctly. She has now learned to remove and replace it herself, and it serves her a good purpose.

From the moment that the patient was able to take food in a natural way (!) such an intense hunger developed that she could scarcely stay her appetite with double rations. This lasted more than two weeks, and she acquired strength so rapidly that in the seventh week she was exhibited at the Medical Society in Warsaw. Regeneration of the neoplasm has not as yet taken place.

The examination of the extirpated larynx showed that the anterior commissure was completely occupied by cancerous growth; the vocal cords degenerated; the mucous membrane of the posterior laryngeal surface intact; the cancerous infiltration reached to the lower edge of the cricoid cartilage, but did not descend into the trachea; the growth has caused destruction and perforation of the *pomum Adami*, forming a path through which the fungoid mass protruded outward; the microscopical examination showed that the growth was mainly made up of cylindrical epithelial cells.

Kosinski, *à propos* of the operation, makes the following observations:

1. In all of the cases so far recorded, the extirpation of the larynx has been undertaken on account of malignant growths (cancer, epithelioma, fibro-adenoma carcinomatodes). According to his opinion, the severe operation is only indicated in such instances as described, where the pathological changes lead to stenosis. He does not believe in a partial extirpation with the use of the artificial vocal apparatus, on account of chondritis or perichondritis with stenosis; in these cases we must be content with a tracheotomy.

2. In all of the cases of extirpation so far described, the malignant growth has been confined to the interior of the larynx; his is the first case in which the skin and cartilages have been perforated, and the cancer protruded outward in the form of a fungoid tumor.

3. So far the operation has been performed upon men, alone; the case which Kosinski describes is the first in which a woman was the subject. This fact indicates a predilection of the disease for males, having its cause, perhaps, in tobacco-smoking (!). Careful statistics upon this point are desirable.

4. It is desirable to perform the preliminary tracheotomy a few weeks before the extirpation of the larynx, in order to cause the adhesion of the trachea to the skin to be as strong as possible, and therefore to prevent the trachea slipping downward, during or after the operation; it likewise facilitates the process of extirpation, and renders the bleeding much less. It appears advisable to accustom the patient to the presence of the tampon in the trachea previous to the operation.

5. The operation is rendered much easier by the chloroform-narcosis, and the tamponing of the trachea (so far Bottini alone has operated without chloroform). With Maas, Kosinski agrees that the entire removal of the epiglottis is desirable (even when it is not implicated in the morbid process), because it facilitates very markedly the introduction of the artificial larynx.

(The article from which the above translation is made is dated May 24, 1877.)

2. Dr. Simpson showed a soldier at the Manchester Medical Society with a papillomatous growth in the larynx; the position of the mass was demonstrated by the laryngoscope; portions of the growth had been removed by means of the laryngeal forceps.

9. Marcet states that a congested state of the epiglottis is not an unfrequent occurrence; it becomes streaked with enlarged capillary vessels, its lingual surface exhibiting much the same appearance as the back of the tongue, near its root, often does in sore-throat. The only change of form in the organ which he has occasionally noticed in these cases is a slight alteration in its free edge, which appears straighter and sharper than it should be. In such cases, there may be no outward sign of any affection of the epiglottis; no pain is felt by the patient on deglutition, and there is no sensation recalling the presence of a foreign body in the throat. The patient will complain of sore-throat, and, on examination, the root of the tongue will probably be found streaked with enlarged capillaries, exhibiting patches of raised follicles, while the surface of the epiglottis is also seen to be in a congested state. This state of the epiglottis may, of course, be quite independent of such causes as syphilis, tubercle, or malignant disease; still it does not show a healthy state of the nutrition of the part, and he is always inclined to consider these cases as more serious than those of common sore-throat.

Tubercular inflammation of the epiglottis is not unlikely to commence in this way, but in such cases we may expect to find the lungs primarily affected. Marcet shows, however, in his article (cases which go to prove it are given), that the epiglottis, and also the larynx, may become the seat of tubercular disease, although the physical examination of the chest should exhibit no signs of the lungs being affected. Disease of the epiglottis is often attended with thickening of the organ, alteration of its normal shape, ulceration, or a waste of substance leading to pitting, and he has seen cases of advanced laryngeal phthisis in which the epiglottis had nearly wasted away.

Thickening and an altered shape of the epiglottis in other respects seldom result from simple inflammation, and may be considered, as a rule, as due to tubercular, syphilitic, or malignant disease. He has observed, however, a few cases in which there appeared to be no constitutional affection of any kind, and yet the epiglottis had become inflamed and enlarged (cases given). The importance of a correct diagnosis of disease of the epiglottis cannot be insisted upon too strongly. While mercurial preparations will be clearly indicated in syphilitic cases, they should be carefully avoided when the larynx is affected by tubercular disease. This statement is borne out by personal experience, but it is now generally admitted that mercury should be invariably withheld in cases of phthisis.

With respect to the treatment of diseases of the epiglottis, Marcet uses, in common inflammation, applications of iodized oil to the part, the solution consisting of fifteen or twenty grains of iodine in one ounce of the expressed oil of almonds; oil of almonds is preferable to olive-oil, being less disagreeable to the taste. Should there be any thickening of the part, either sirup of the iodide of iron or iodide of potassium is given

internally, and iodized oil is also rubbed externally on the throat two or three times a day. The treatment of tubercular disease of the epiglottis and of the larynx is unsatisfactory, although the acute symptoms may be much relieved and the patient made comfortable. Iodized oil, or the application of anodynes, often proves of benefit. In one case he has applied solid nitrate of silver to the epiglottis affected with tubercular disease, in accordance with Krishaber's suggestion, and using his laryngeal caustic-holder. The patient felt no pain whatever, and the result was encouraging. Inhalations of iodine he has never found of any use in the treatment of tubercular or syphilitic affections of the epiglottis or larynx. During the stage of active inflammation they may produce much distress and increase of pain from local irritation, without doing any good ultimately.

10. Dr. Thomas, in reviewing Dr. Marcet's paper (No. 9), considers it worthy of the most careful consideration. Personally, he has remarked that reported pain in swallowing and obstruction are often put down to hysteria or fancy, if nothing is to be seen in the fauces, or if an examination with a probang detects no stricture or tender spot. Yet a laryngoscopic examination may very easily be made to disclose some possibly remediable disease of the epiglottis. In cases of great pain in swallowing, with no visible clew or emaciation, he has frequently discovered a small syphilitic ulcer or ulcers on the free edge, or on the lingual aspect of the base of the epiglottis, which were readily healed by a few applications of nitrate of silver. Chronic congestion of the epiglottis, however, attended by a varicose condition of the vessels, is a much more difficult matter to relieve; the epiglottis may be extensively destroyed by syphilis without the evidence remaining of the disease, in the interior of the larynx or in the palate. He agrees with Dr. Marcet that tubercular disease may commence in the epiglottis without its being manifest in the lungs or vocal cords, but does not agree to the application of nitrate of silver in laryngeal phthisis, whether in solution or solid, as it produces great pain, and frequently terrible spasm, though a very weak application of chloride of zinc certainly diminishes pain. Anodyne inhalations are also very grateful to the patient.

11. Sawyer, criticising Thomas's statement (abstract No. 10) that nitrate of silver in laryngeal phthisis is injurious, says that, in his hands, it has proved a valuable remedy in the disease. When the mucous membrane of the larynx is swollen or ulcerated, we ought regularly to brush it twice or thrice a week with a solution of nitrate of silver, of the strength of one drachm of the salt to a fluid ounce of water. In this remedy, so used, he has abundant ground for confidence, and has found this kind of local treatment especially reliable in relieving or removing the difficulty of deglutition, which is often such a prominent and painful symptom in laryngeal phthisis. He supposes that the nitrate of silver acts beneficially in these cases mainly by deadening the morbid sensibility of the tumid and ulcerated mucous membrane, and it thus, by diminishing the tenderness of the parts, renders swallowing less painful; and also, by lessening the sense of laryngeal irritation, abates the tendency to coughing. In many cases, in order to produce these good results, it is sufficient to apply the remedy only to the swollen epiglottis and arytaeno-epiglottidean folds, without carrying the brush within the rima glottidis. In simple chronic laryngitis, the application of a solution of nitrate of silver to the mucous membrane of the larynx is often of service, but it causes considerable pain, and sometimes rather alarming spasm. Laryngeal phthisis is a malady so painful, and so fatal, and so little controllable by treatment, that we cannot afford to dispense with the use of any method of medication which can in any degree relieve its symptoms or retard its progress.

13. During an operation for epithelioma of the tongue—the patient

being under the influence of chloroform—he suddenly stopped breathing. Pressure upon the chest and abdomen was immediately made. As it was removed, there was a sound of air passing through the larynx. This sound gradually changed to a faint hiccough, and then ceased. The tongue had been secured and drawn forward. Sylvester's method was now tried with similar failure; for, although the air passed through the larynx at first audibly, after a few movements the sound became a short hiccough, and then ceased. After persevering for perhaps two minutes in endeavoring to produce artificial respiration, but in vain, recourse was had to laryngotomy. The radial pulse could not be felt. After the laryngeal tube was inserted, the Sylvester method answered admirably; air immediately entered and escaped through the tube. At this juncture it was evident that the *artificial respiratory acts* produced by the persistence in the Sylvester method *were now rendered serviceable* in emptying and filling the lungs *through the tube instead of failing to do so, as before, through the glottis*. This was the turning-point in the condition of the patient. From this time breathing went on without the mechanical assistance of the Sylvester method. The operation was then completed. The interest of the case relates to the question of opening the larynx. The results of this operation in chloroform-accidents have not hitherto been favorable. Not only have most of such cases died in spite of it, but a large proportion of cases of chloroform-asphyxia are restored by other means. It is probable that in most of the unsuccessful cases chloroform had produced cardiac syncope, and the circulation had ceased before the windpipe was opened. In this case, however, the operator supposes that when the first pause in the respiration took place, the saliva, mucus, or perhaps a small clot of blood, got over the glottis, and impeded without altogether stopping the passage of air during the respiration which followed. The state of the glottis when asphyxia from an anæsthetic is impending is very different from its normal one; the muscles which dilate the opening are paralyzed, and its sides lie closely together, so that a very little mucus or blood lying over that aperture would close the way. The rule which Clover gives for like accidents is, that when under artificial respiratory movements of the thoracic walls glottidean respiration ceases, and no pulse can be felt, the prompt admission of air through an opening in the larynx, coupled, of course, with perseverance in the Sylvester method, appears to be an imperative duty.

21. Krishaber recommends that the granulations which characterize a glandular laryngitis be painted two or three times weekly, with the following solution: distilled water, eighteen grammes; iodide of potassium, three grammes; iodine, one gramme. In other cases he uses the insufflation of various powders, such as nitrate of silver mixed with sugar (one-sixth to one-tenth), pure sub-nitrate of bismuth or mixed with equal parts of sugar or of starch; finally, finely-pulverized salt with various astringent substances.

22. From Bresgen's contribution we select, as interesting, a case of paralysis of the vocal cords, which was cured by electricity, only *after* the removal, by surgical means, of the hypertrophied pharyngeal tonsil (Philipeaux). Gerhardt, especially, holds the view that any irritation of the pharyngeal parts may cause a reflex paralysis of the cords. In a case of adenoma of the pharynx in a girl of twenty, the paralytic aphonia immediately improved after the removal of the tumor. Bresgen believes that the glosso-pharyngeal nerve, which supplies with its lingual branch the mucous membrane of the palatine arches, the tonsils, the upper surface of the epiglottis, and the base of the tongue, through its numerous anastomoses with the vagus and sympathetic, presents a direct path for reflex paralysis of the larynx. In another case which is detailed (a girl of

eighteen), an improvement in the paralysis of the right vocal cord followed, in a most striking manner, the removal of adenoid tumors from the vault of the pharynx, a fact that is specially interesting, when we are told that, previously, electricity had been used for fourteen days without the least success.

24. In the course of some clinical remarks on catarrhal laryngitis, Whipple states that the disease may assume either a mild or an intense form, and the one may pass rapidly into the other. It may be traced to a variety of causes, such as—1. Local irritants acting on the larynx; for example, cold air, dust, loud screaming, etc., which cause friction by the air being forcibly driven through the glottis, and by the increase in the number of vibrations of the vocal cords in a given time. 2. Chilling of the skin; e.g., by leaving off warm clothing. 3. Catarrh may extend from neighboring organs. Each of these classes is then taken up in order and fully discussed. Having alluded to the prominent causes of the affection, the more obvious means at our disposal for its prevention are reviewed, and one or two points in the treatment of the early stages of the affection are briefly touched upon. Confinement in one apartment, with the air rendered moist and warm, is of the first importance, as soon as the first "brassy" cough is heard. Often no further treatment is demanded. In more urgent cases further treatment may be necessary. Hot poultices to the neck have, in his experience, produced excellent results; the poultices may be made of linseed-meal simply, or of linseed and mustard in the proportion of about one part of the latter to eleven of the former. Later he has used a poultice made of oatmeal and vinegar, which he was induced to try, in order to combine the warmth of the external application with the sedative action of the acetic acid on the laryngeal mucous membrane. The results have been extremely satisfactory. The throat being enveloped by the poultice, the child of necessity inhales the vapor charged with acetic acid which arises from it, and there is no need for the use of an inhaler which usually frightens the child. Should the pulse be frequent, the skin hot and dry, and other symptoms of fever be present, a purge composed of calomel and rhubarb may be advantageously administered together with a mixture composed of diaphoretics, depressants, or diuretics. If the inflammation be not thus subdued, subsequent treatment must be adapted to the exigencies of the case.

25. Böcker describes a case of laryngeal stenosis, caused by a membrane stretched immediately below the vocal cords, and impervious to the respiratory current, except through a small opening. The condition was remarkable, inasmuch as the clinical history gave no cause for its development; neither injury, diphtheria, syphilis, nor other reason could be determined upon. The membrane was removed between the 14th of June and the 10th of July, by the natural passages, without preliminary tracheotomy. The second case detailed is one of paralysis of both posterior crico-arytenoid muscles in a woman of syphilitic antecedents. Tracheotomy, which had to be performed on account of the urgent dyspnoea, failed to relieve it; and the existence of some narrowed point below the canula was, therefore, more than probable. Careful examination by the sound, however, could not detect it. Attempts at removal of the canula increased the dyspnoea to such an extent that it was necessarily replaced. Böcker remarks that, in this case, the excursion of the larynx both in inspiration and expiration, before as well as after the tracheotomy, measured two centimetres; while Gerhardt asserts that the larynx, when it is stenosed, makes greater excursion, while in tracheal stenosis its movements are slight—a fact which he utilizes for diagnosis between laryngeal and tracheal stenosis.

26. Sidlo's article is made up of a careful analysis of the 1876 report of

the Military Hospital in Vienna, comprising only the cases of pharyngeal and laryngeal diseases treated there during that time. These numbered 353 treated in the hospital, and 100 examined and treated in the "out-door" department. The paper is interesting from a statistical point of view.

27. Dr. Watson, in a clinical account of some cases of laryngeal growths, states that these are by no means of common occurrence in any part of the world; but in Glasgow, perhaps in all Scotland, they seem to be peculiarly rare. Considering the comparatively greater number of such cases met with elsewhere, he has wondered if it was not possible that some instances of this affection might be overlooked with them, or consigned to some other class in the nosology; for, without considerable skill in the use of the laryngoscope, it is quite impossible to make a satisfactory diagnosis of these cases, and perhaps, therefore, in the hurry of general practice, they may be allowed to pass without due attention. He reports the histories of three cases treated by him, which he considers typical of three important kinds of intra-laryngeal growths. The first case is—papillomatous growths on the vocal cords; excision of one and reduction of the other with nitrate of silver; cure. Each vocal cord was encumbered by a small, elongated, sessile growth, of a pale-red color. Besides this case, he has met with several others of a similar kind, though of less extent; the symptoms in all were much the same, and, on examination, only a red serration of small outgrowths was seen on the margins of, generally, both vocal cords. In these cases the application of a solution of perchloride of iron, or of solid nitrate of silver, as a coating upon a long probe, has sufficed to remove the disease.

He has been accustomed to speak and think of this state of the cords as probably identical with the granular state of the conjunctiva, which sometimes follows inflammation of that membrane, and believes that the so-called papillomatous tumors of the larynx are just exaggerations of one or of more of the villous projections which have originated in lymphatic exudation beneath the epithelium. In some cases this matter, instead of being absorbed, becomes organized into a neoplasm, which is of the most benign description, and when removed has no tendency to recur, except, perhaps, from a renewal of the inflammatory process.

The second case was one of epithelioma of the larynx; pulmonary complication; tracheotomy; death nine months afterward. *Post-mortem* examination of the larynx. In connection with this case it is remarked that, in all like cases, where the nature of the laryngeal tumor is clearly made out to be epitheliomatous, it will not generally be found prudent to interfere with it locally; that partial ablation is worse than useless, and that attempts at removal ought never to be made. He likewise deprecates thyrotomy for the purpose of excision, as well as the operation for entire removal of the larynx, holding that it is hardly justifiable to perform any severe or hazardous operation for the removal of any such tumor, because of the liability of the disease to recur, and the trifling extension of life afforded by the best efforts of the surgeon.

Hence he thinks that, when such disease affects the larynx, we probably give the greatest amount of relief to the distress of the patient, and prolong his days to the utmost of our power, by performing tracheotomy fairly below the seat of the affection. By such an operation the tumor is, of course, allowed to remain, but it is freed from the motions of the larynx, and the irritation of the passage of air through the narrowed glottis; and thus it is permitted to become chronic, and to pursue a much slower course than before.

The third and last case which is reported is one of epithelial wart upon the left vocal cord. Ablation with Mackenzie's forceps; cure. The chief

point of interest in connection with it is, the very great irritability of the throat, which was the chief obstacle to operative procedure. No drugs are effectual for controlling this state of things; careful regulation of the stomach and bowels, and abstinence from food before submitting to the necessary manipulations, are the means most generally useful in allaying this peculiar sensitiveness. The much-vaunted bromide of potassium has little, if any, special soothing power over the nerves of the throat; and, when it seems to do good, it is more by assisting to correct gastric digestion than by acting locally. In some few cases he has obtained benefit by making the patient inhale a little chloroform; but this can only be of limited applicability. On the whole, rapid and decided action is the best way of getting over the difficulty, though it must be remembered that such rapidity is not free from danger, and that considerable skill and experience are necessary.

28. Dr. Durodié, of Bordeaux, recently had under treatment a case of croup in a child seven years of age, in which tracheotomy became indicated. The parents, however, refused to sanction the operation, and the doctor, as a last resort, determined to swab out the larynx according to the plan first recommended by Dr. Green, of New York. The child was securely held, and the left index-finger of the operator was introduced into its pharynx as far as the opening of the larynx; a small sponge, which was firmly secured at the end of a piece of curved whalebone, was then dipped into warm water, and, guided by the finger, was pushed into the larynx, where it was rapidly moved up and down three or four times before being withdrawn. This manœuvre was repeated three times at each visit, and each time the sponge, when withdrawn, was covered with the *débris* of false membranes. This treatment was continued four days, when all danger of asphyxia disappeared. When the treatment was begun, the patient was in the last extremity, and the improvement was manifest at once. Dr. Durodié thinks that the success was due in part to the reflex spasmodic movements provoked by the contact of the sponge with the laryngeal mucosa, these movements causing the ejection of the portions of the false membrane left by the sponge.

29. Lasinski recommends the insufflation into the larynx of the patient of a small quantity of a powder composed of thirty grains of salicylic acid, fifteen grains of quinine, seven grains of bicarbonate of soda, and seven grains of sugar. This should be done twice daily, and the above quantity should last about ten days. He adopted this treatment in fifteen cases of severe whooping-cough, and all were cured in periods varying from eight to thirty days. (*Month's Abst. Med. Sci.*)

36. Following Michel's recommendation, Reisenfeld has treated some fifty cases of chronic pharyngeal catarrh by means of the galvano-cautery; the cases, in the main, being those in which there was no hypertrophy of the follicles. With the results of the treatment he is more than satisfied. He uses Middeldorpf's battery and a knife-shaped cautery, making on the posterior pharyngeal wall, as well as on the uvula and tonsils, numerous superficial and linear eschars, their number and depth depending upon the grade of the affection. Patients bear the little operation well, its only drawback being the smell of burnt flesh. Care must be taken, however, not to burn the tongue. Following the operation there is usually some dysphagia; this is treated for two days with water-gargles, and avoidance of solid food. The eschars separate in from four to five days. Suppuration, when it occurs, never lasts longer than eight days. In recent cases one cauterization is sufficient; in any case, never more than five.

39. Cassells assumes that Weber's nasal douche has been, and still is, held in high repute, more especially by those who have used it frequently.

and found it to be, what it really is, a highly-effective and not unpleasant mode of treating certain affections of the naso-pharynx; so satisfactory, indeed, as to make it difficult, if not impossible, for any one to devise an equally efficient substitute, were such a step deemed necessary. This being so, it is somewhat startling to be told by authorities of no mean eminence (Roosa, Buck) that there was a danger of doing serious injury to the ears in using the Weber's douche. Roosa, for instance, says that "it ought to be discountenanced by the profession," while Buck states that "there is danger attending the introduction of fluids into the nasal passages" to the ears, and also raises the question of the safety of introducing fluids at all into the nasal passages, recommending the "swabbing-out" process. In these circumstances, says Cassells, when a therapeutic proceeding of acknowledged value is threatened with extinction, it seems high time, in the interest of general and special practitioners as well, to inquire if there be good grounds for this new alarm, by examining the evidence upon which it is based. This he proceeds to do, and arrives at the conclusion that, concerning the opinion of Roosa, that "the use of the Weber's douche ought to be discountenanced by the profession . . . even with proper precautions" taken as to the mode of employing it, with every respect for the deservedly great authority of this writer, he does not share in his apprehensions regarding its evil effects on the ears, for the best of all reasons, viz., that in his hands it has invariably proved itself to be a perfectly safe and not unpleasant proceeding; and under these circumstances he suggests if the evidence which he (Roosa) offers in support of the position which he holds with regard to this measure be not in proof of the *misuse* rather than the *use* of this douche. To *use* a right remedy wrongly in a right case, or rightly in a wrong one, and to expect good results to follow, is surely a little unreasonable, but in such circumstances to blame the *use* of the remedy seems to him to be as unjust as it is unscientific; the *misuse* of a thing cannot be urged as a hinderance to its *use*. The evidence presented by Buck, also, he holds, does not warrant the conclusions that he arrives at. It is too weak and too inconclusive to be employed in a condemnation so wholesale as that indulged in, and, if it proves anything at all, it proves, even more conclusively than Roosa's evidence, that in all the cases reported by Buck the fluids were passed into the nasal passages in improper cases, or used improperly in cases that justified their use; here again showing that the terms "use" and "misuse" have been misplaced, as well as misapplied. In Cassells's out-door *clinique* he has treated with *his own hands* upward of 2,300 cases of ear-disease in which the nasal passages were more or less affected with one or other of the many forms of catarrh. These all occurred in the persons of poor and mostly ill-fed, badly-clothed people of all ages. Two-thirds of that number have used the nasal douche in one or other of its forms. The siphon-douche, when necessary, is always used upon the patient by himself; so with the anterior and posterior modifications of it; the "snuffing-up" process always was used by the patients for carrying out home-treatment; most of the patients used the douche for several weeks each, on an average; some, indeed, have used it without intermission for two years. The report that he has to record is, that he has neither seen nor heard of an untoward result, not even a single complaint. In his private practice he has had a like experience, and the same result to report. This being so, it is perhaps quite warrantable, he says, that he should be asked to account for this success in the use of an operation that seems in other hands to have proved hurtful. To this he replies that he never uses it except in appropriate cases; never trusts the use of the siphon-douche to the patient, but in every case performs the operation upon the patient himself; self-

use in this, as in many similar circumstances, mostly means self-abuse. After deciding that the case is one in which the douche is admissible, he observes the following precautions, which, he adds, are applicable to the various modifications of the process: To have the fluid to be used non-irritating, of a density greater than the serum of the blood, about 90° Fahr. in temperature, and *never to use pure water alone*; to give the column of water a fall from a point about one foot above the level of the patient's nose, patient meanwhile leaning forward and breathing short, rapid breaths, about forty to the minute, interrupting the flow of the fluid every few seconds to allow of the patient's resting, and to permit of the nostrils being sniffed out from behind by a succession of violent expirations through the nostrils, the *mouth being closed*, stopping the fluid from passing into the nostrils the instant that the patient ceases to breathe as he has directed, or on any involuntary act of swallowing taking place on the part of the patient; finally, in all cases, never to allow the patient to blow the nose after using the douche until all the residual fluid has been expelled from the nasal passages by oft-repeated and strong expirations through them with the mouth closed; lastly, never to begin the douche till the patient thoroughly comprehends the part that he or she is expected to perform during the proceeding.

The interesting paper closes as follows: "To sum up what has been said, I may repeat that the evidence adduced by Drs. Roosa and Buck does not warrant the condemnation of the *use* of the nasal douche, nor does it show that there is danger attending the introduction of fluids into the nasal passages; on the contrary, it shows that the misuse of a recognized and valuable therapeutic measure has been followed by bad consequences, which is no more than has happened and must happen in like circumstances, as the history of Eustachian catheterism shows, for example; yet who, I may be permitted to say, would feel warranted in asking that the *use* of the catheter should be discountenanced because dangerous consequences have resulted from its misuse? My own position with regard to the nasal douche in all its modifications is quite clearly defined. With proper precautions, both on the part of the operator and on that of the patient, no harm need result; nay, its use under such circumstances is as free from danger as is the use of the Eustachian catheter when prudence and skill guide the judgment and the hand of the operator."

40. In a lengthy and interesting paper with the striking title, "Shut your Mouth and save your Life," Cassells suggests to medical practitioners in general that this proverb merits their best attention, regarded in a sanitary sense, for he feels satisfied that in their hands it might prove to be a most valuable therapeutic procedure, not only in the prevention and cure of ear-diseases, but in the prevention and cure of those ever-recurring catarrhal affections of the naso-bronchial mucous membranes which prove so intractable under every and all forms of treatment.

43. Guillon has treated diphtheritic pharyngitis by insufflations of nitrate of silver. He uses an instrument composed of a wooden cylinder in which the powder is placed (pure nitrate of silver dried by heating it to a proper degree), an India-rubber bellows or bag, and two tubes, one straight for the pharynx, the other curved for the larynx. As the insufflation is performed in two or three seconds, and as the pain produced by the nitrate-of-silver powder only shows itself a little later, the first insufflation must be made when the patient draws a deep breath. In this way the powder penetrates into the larynx and arrests the croupal affection at the outset before the pain is developed. It is understood that some symptoms of incipient croup should be present when the insufflation is finished; the tube of the insufflator should be cleaned, and the silver-powder put away in a well-stoppered bottle. As diphtheritic membranes sometimes

reappear, the doctor uses astringent gargles to prevent their development, and, if these means be not adequate, he has recourse to a fresh insufflation.

46. Voss, in a very elaborate article on extirpation of the tonsils, gives the following causes for the operation. He has performed it upon 347 individuals (164 males, 183 females), as follows:

1. For simple hypertrophy of both tonsils, in 28 patients.
2. For repeated inflammation of the fauces in 101.
3. For pharyngeal diphtheria once; diphtheritis of the wound-surface followed, but cure took place.
4. In syphilis once; an hypertrophied and ulcerated tonsil.
5. In chronic pharyngitis associated with ozæna or laryngitis.
6. In coryza and ozæna with snoring breathing during sleep.
7. In deafness (catarrh-otorrhœa).
8. In hypertrophy of the lymphatics of the neck, in the belief that on account of the similarity of the histological structure of these and the tonsils (follicles) perhaps a casual relation pertained.
9. In cough, intermittent or chronic, be it of laryngeal, tracheal, or bronchial origin.
10. In asthma.

11. In phthisis and phthisical predisposition, the author says, phthisical antecedents are a fact upon which he lays weight when concomitant tonsillar hypertrophy, indicating amputation, exists, when with this hypertrophy is associated repeated inflammation or constant cough of a long duration. Such cases, the family history showing a predisposition to the development of tubercle, are to be feared, because the repeated tonsillar inflammation may be the point of departure for an affection which can spread downward over the mucous membrane of the air-passages. In any event hypertrophied tonsils present a more likely source of irritation than any other part of the pharynx.

12. In badly-nourished conditions; in such cases tonsillar amputation is performed, because the tonsillar hypertrophy presents a barrier to easy and free respiration.

13. In chronic cephalgia; in six cases of this character the tonsils were much enlarged and the breathing somewhat interfered with; in two cases cure soon followed the operation; two were improved; two remained uncured. The severe hæmorrhage which sometimes follows the operation Voss believes to always come from the tonsillar artery, and never from the internal carotid, although an injury to it may be suspected for a moment on account of the profuse bleeding. He does not believe that such a hæmorrhage can lead to death. Solid nitrate of silver, chloride of iron, pressure upon the wound with counter-pressure without, never fail to control the bleeding; the ordinary Fahnenstock tonsillotome is used in operating.

The amputation of the uvula has been performed by Voss in thirty-eight cases. Bleeding is controlled by nitrate of silver; he having discovered that gargling with cold water predisposes to secondary hæmorrhage. Nitrate of silver never fails to control the spurting capillaries; and under its use the wound contracts and granulates most satisfactorily.

47. In removing the tonsils with the guillotine it is important to remember that the organs are situated obliquely, like the pillars of the soft palate; more pressure should be made upon the lower than on the upper border of the instrument, and the tonsil will be readily seized. It is better not to attempt to remove the whole of the organ, for after the removal of a portion the rest will atrophy, and removal of the whole is liable to be followed by dangerous and very obstinate hæmorrhage. The hæmorrhage may be due to the existence of inflammation at the time of operating, which inflammation also has a tendency to make the substance of the organ fri-

able, so that it will have to be removed in small pieces; hence it is always advisable to defer the operation until the inflammatory stage has passed.

The great danger of hæmorrhage, however, lies in the possibility of opening into the rich venous plexus which lies at the bottom of the tonsillar fossa, and which is very easily wounded when the tonsil is removed entire. The hæmorrhage from this source is sometimes extremely profuse, and is kept up by the movements of deglutition and spitting. The bleeding is not always primary, hence it is necessary to keep the patients under observation for a time. Sometimes it recurs after it has been once arrested. All the usual methods of checking the bleeding are unreliable, with the exception of direct compression made by the finger of the surgeon. The finger should be introduced into the mouth and applied directly to the wound, while counter-pressure is made in front. This position must be maintained for several minutes, notwithstanding the attacks of suffocation, the efforts at vomiting, and the cough which the method excites. The hæmorrhage is generally arrested at the end of two minutes. Dr. Panas, of the Hôpital Lariboisière in Paris, has on three occasions been called on to stop considerable hæmorrhages from this cause, and succeeded in promptly arresting them by this procedure.

48. Störk's article is devoted to the consideration of the subject of adenoid vegetations at the vault of the pharynx, and the various operations or procedures for their removal. An illustrative case is given, also one of naso-pharyngeal polypus as a "supplement."

55. In these excellent lectures, which have evidently been prepared with much care, and present evidences of considerable study and research, as an inspection, aside from the subject-matter, of the copious references to literature and the detailed historical account which opens, for instance, the section on mucous polypi of the nose, will show, the subject of tumors or neoplasms of the nasal cavity is fully discussed from the stand-points of etiology, symptoms, pathology, prognosis, and treatment. To go more into detail, we find Lecture I. devoted to the consideration of that variety of intra-nasal growth which occurs more frequently than all other forms combined, viz., the mucous or common polypus of the nose, and, it being the typical growth, it is not only treated of first, but with more completeness of detail; the other forms of polypus, taken up in the second lecture, which are much rarer, receiving a more superficial consideration. The various plans of treatment for the affection, which are considered, some being reviewed very thoroughly, are: 1. The application of drugs (chloride of zinc, perchloride of iron, bichromate of potash, nitrate of silver, tannin or saffronized tincture of opium); 2. Evulsion, either by the forceps or the wire snare; 3. The galvano-cautery; 4. Manipulation as advised by Gross; and, 5. Removal after enlargement of the outlets of the nasal cavity, with laminaria as in Thudichum's plan, by cutting either anteriorly or posteriorly as recommended by Dieffenbach, or, where the growth is situated near the pharynx, cutting through the soft palate on the side affected (Dionis).

The more serious operations for the removal of intra-nasal growths which cannot be extracted *per vias naturales*, are treated of in the second lecture.

In the writer's opinion, no method of removing mucous polypi is equal, in simplicity, certainty, and rapidity, to evulsion by means of the forceps.

In Lecture II. the rarer kinds of nasal growths are discussed—some trifling ailments, causing slight inconvenience; others, terrible diseases, giving rise to hideous distortion of the features, immense suffering, and terminating in death. Of the benign growths which he now proceeds to consider in detail, there are, in addition to mucous polypus already treated of in the first lecture, papillomata, of unfrequent occurrence, and fibromata,

under the head of treatment of this latter form. After passing in review briefly the now obsolete methods, he details the use of the ligature, enlargement of the outlets of the nasal fossæ, and the operative steps of Langenbeck, of Nélaton, as well as those for excision of the upper jaw. Of the quasi-malignant growths, sarcoma is the only example, while carcinoma originating in the nose is so rare that it may almost be excluded; the fibrous and sarcomatous growths, however, he states, often run a course which places them clinically on a level with cancer.

Finally, cartilaginous and osseous growths are treated of, the latter presenting three classes of formation: 1. Exostoses, or growths from the bones which may be the result of strumous or syphilitic disease of the osseous framework of the nasal cavity. 2. Ossified cartilaginous, sarcomatous growths; and, 3. The peculiar osseous tumors which are developed independently of any apparent disease of the bones or soft parts, and always remain more or less free and movable.

56. Schuster's paper is a well-written and interesting one, and forms a valuable contribution to our knowledge on the subject of nasal syphilis. The cases upon which it is based have been carefully worked up, are reported in full, and the deductions drawn from them are, therefore, entitled to consideration. The microscopical examinations of morbid structures pertaining to some of them have been made by Dr. Sänger, the assistant in the pathological laboratory at Leipsic, and are fully illustrated in the lithographic plate which accompanies the article. The paper opens with a short review of the recent literature of the subject, the views in general of Schede, Volkmann, Hamilton, Michels, Diday, Störk, Michæelis, and Bardenheuer, being given; then follows the detailed history of cases, those being first given in which no microscopical examination supplements the clinical details; finally, the analysis of the cases presented, and the general deductions. As regards treatment, Schuster's experience has convinced him that Volkmann's procedure (removal of morbid tissue and necrotic bone by means of a sharp, spoon-like instrument), together with careful watching for months, and thorough general treatment, will save the nose from deformity.

Some general directions regarding this plan of treatment are given, but for special details the reader is referred to the works of Schede and Volkmann.

57. A paper devoted mainly to proving that the Weber douche is inefficient, and has an injurious effect upon every patient who employs it. Cases are given in illustration of the assertion, drawn from the writer's practice.

65. Dr. Breakell reports the following case: M. C., aged four years, while playing with a piece of the shell of a peach-pit, put it in her mouth, and during the respiratory act drew it into her trachea, October 14, 1876. She was seized with a violent paroxysm of coughing, but failed to expel the foreign body. A few days after this occurrence he saw her; she was then suffering from an attack of pneumonia, confined to the upper portion of the right lung.

The patient passed from his observation to the care of Dr. J. L. Little, who requested Dr. J. R. Leaning to see the case with him, and a diagnosis of a foreign body in the third branch of the first division of the right bronchus, the same place as that of the button case in Dr. Markoe's practice, was made.

All efforts to induce the friends to have tracheotomy performed for the removal of the foreign body proved unavailing, and the child was left, as supposed, to her fate. She, however, gradually recovered from the affection of the lung, and remained well for about one month, when Dr. Breakell was called to attend her. She was again suffering from pneumonia

in the same situation, which passed through the usual stages, and ended in recovery. The patient suffered considerably from cough and fetid breath for about three weeks after the accident, until April 13, 1877, when she was seized with a convulsion, followed by a violent paroxysm of coughing, during which the foreign body was expelled after having been in the lung for the period five months. The child has since done well.

The piece was of triangular in shape, weighing three grains, and the perimeter being one and three-eighths inch.

68. In a man with stenosis of the larynx due to syphilis, and a marked discoloration of the face and neck, resembling argyriasis, tracheotomy was performed in 1871, on account of urgent dyspnœa. During the passage of the canula, a vein, probably in direct communication with the internal jugular, was accidentally opened, and the severe hæmorrhage improved the dyspnœa so markedly that the canula was not needed. In 1871 and 1874 tracheotomy was again performed, the introduction of the canula being attended with great difficulty. On the last occasion the discoloration of the face was distinctly observed. Shortly after the last tracheotomy, dyspnœa recurred, but was relieved by an anti-syphilitic treatment and absolute rest. In July, 1876, the operation was again demanded. The stricture was formed by the thickened and ulcerated true and false vocal cords, together with the misshapen epiglottis. The discoloration of the skin was believed to be due to the incomplete oxidation of the blood, as well as the impaired circulation in the capillaries of the parts. It is stated that after the last operation this discoloration was much improved.

CONTRIBUTED BY DRS. SAMUEL B. WARD AND GEORGE R. CUTTER.

SURGERY.

Carbolic Acid as an Anæsthetic.—Dr. R. J. Levis, surgeon to the Pennsylvania Hospital, contributed an article to the *Philadelphia Medical Times* of March 15, 1876, on the prevention of pain after the application of the actual cautery. He avails himself of the local anæsthetic action of carbolic acid, and it is his practice to apply pure carbolic acid on, and for a short distance around, each point of application of the cautery, before the patient recovers from the influence of the general anæsthetic which has been used. For convenience of application, the crystals of carbolic acid are deliquesced by warmth, and the liquid applied with a brush. The part is then covered with any light dressing. Should pain recur after extensive and deep use of the cautery, the application may be renewed, but he has not, in his experience, found such resort necessary. S. B. W.

New Method of reducing Dislocations of the Shoulder.—In the *Gazette Médicale de Paris* (quoted in the *Paris Médicale*, March 9, 1876), Dr. Kuhn, of Elbeuf, describes a new method of reducing dislocations of the shoulder. He calls attention to the fact that there is a loss of force, due to the scapula following the traction made on the humerus, in the method ordinarily employed to reduce luxations of the shoulder-joint. He claims, on the contrary, that by making the humerus the fixed point, and reducing the scapula, there is no loss of power, and the resistance of those powerful muscles, the pectoralis major and latissimus dorsi, is obviated. With a passing reference to anæsthetics, and the prejudice which some practitioners entertain against their use, he proceeds to the *modus operandi*.

A wedge-shaped cushion is placed in the axilla, the base of the wedge being downward; the surgeon, standing at the patient's side, lightly draws the arm downward, and at the same time presses it firmly against the pad in the axilla, so as to make it into a lever of the first kind; then, taking the inferior angle of the scapula in the other hand, he raises that bone and gives it a seesaw motion. Coaptation soon follows, the two parts returning to their natural position by a simultaneous effort made on the lower extremity of the humerus and the inferior angle of the scapula. If the head of the humerus be displaced forward, the angle of the scapula should be directed outward, at the same time that it is raised. It should be directed inward if the dislocation be backward. If any difficulty be experienced in making the reduction, the task of holding and directing the arm should be confided to an assistant. S. B. W.

Readheshion of a Separated Portion of the Body.—A man fifty years of age, while drunk, fell twenty metres, and remained the entire night without help. Falling on a curbstone, the cartilaginous portion of the nose was cut transversely at its margin and entirely separated, with the exception of a few slight shreds of skin. The separated portion was quite cold, and appeared to be dead. Dr. Gillebert Dheucourt saw the patient in the morning, and washed the wound with cold water, readjusted the separated portion, secured it with five stitches, and applied pieces of muslin dipped in collodion. The pieces overlapped each other like the shingles on a roof, leaving the point of the nose free. The next day there was some swelling of the parts, but the apex of the nose appeared warm and rose-colored. Two days later the swelling began to subside, and seven days later the stitches were removed. Fourteen days after the operation there was complete restitution of the nose. A linear cicatrix remained, and there was considerable loss of sensibility in the parts which had been separated.—*Allg. med. Centr.-Ztg.* and *Memorabilien*, No. 6, 1877. G. R. C.

DISEASES OF WOMEN.

Alcohol Tampons for Sanious Uterine Carcinoma.—While it is often difficult to destroy the penetrating smell of a sanious uterine carcinoma by means of carbolic acid, chlorine-water, etc., this may be accomplished with marked rapidity and certainty with charpie tampons which have been saturated with absolute alcohol. An attempt to use concentrated solutions of salicylic acid for disinfection led to the use of alcohol in these cases. The first attempt was made with a saturated alcoholic solution of salicylic acid. This experiment having proved successful, absolute alcohol alone was used, with equally good results. The grumous, stinking shreds separated in a few days, and the ulcerated carcinoma presented the appearance of a clean, granulating surface. Nothing further than the mere disinfection is claimed for this remedy.—*Memorabilien*, No. 7, 1877. G. R. C.

OBSTETRICS.

Delivery of a Living Child after the Death of the Mother.—A rather sickly woman died eight days before the regular end of her pregnancy. The physician who was hastily summoned found, on his arrival, that the

body was still warm, and heard over her uterus the weak heart-sounds of the child. He at once passed his hand through the yielding uterine orifice, ruptured the membranes, turned by the feet, and, without special difficulty, delivered a female child of medium size, whose heart still beat. After artificial respiration had been continued for two hours, the child was able to breathe without further assistance. The child continued to live. It was considered that fifteen minutes had elapsed after the death of the mother before the birth of the child.—*Wiener med. Wochenschr.* and *Memorabilien*, No. 6, 1877. G. R. C.

THEORY AND PRACTICE.

Treatment of Black-Vomit.—Dr. D. T. Romay concludes a very interesting article on malignant fever or black-vomit, with an analysis of the most successful remedial measures. Pure, fresh air is one of the best preventives of this disease, and is of great efficacy in limiting its increase. The thirst, anxiety, difficult respiration, and the elevated temperature, all demand that the patient should be placed in a large apartment, where the air has free circulation, and is frequently renewed. The air is rendered more refreshing by sprinkling vinegar about. The patient should be allowed to drink as much water as he desires, and the water may be acidulated with oranges, tamarinds, or some other acid fruit. The tamarind is preferable, as being at the same time laxative. This property may be augmented by the addition of cream of tartar. The thirst is thus modified and the peccant humors evacuated. When the tongue has a thick coat, and the thirst is not troublesome, acids may prove injurious; it is then better to give a tisane of tartarized barley-water. Should the bowels move sluggishly, emollient, diluent, and nitrous enemata will be of service. The latter render many important services besides emptying the bowels, and are regarded by all writers as a very prompt and efficacious auxiliary. Should the vomiting be so excessive and continuous as to prevent nutrition, the enemata may be rendered nutritious by the addition of arrow-root or other feculæ. Antimonials and the active emetics should not be used, for vomiting is one of the most distressing symptoms of the disease. At the outset, a prompt emetic may be allowed, followed by mild laxatives. Two ounces of manna, one of tamarinds, and half an ounce of Glauber's salts dissolved in six of whey, is a good laxative, divided into four doses, to be given according to circumstances. Should its administration be prevented by the nausea, a mild laxative pill may be substituted. Bleeding is sometimes necessary before the administration of the laxative. This is indicated by the sense of weight and pain in the head, the pulsation of the temporal arteries, fullness of the jugular veins, redness of the eyes and face, the fever-heat, thirst, difficult respiration, and the hardness of the pulse. The bleeding should be done early in the disease; during the putrid stage it is hurtful. If the blood is taken in small quantities, the pulse will indicate when to stop. The coma-vigil may be relieved by puncturing the temporal arteries. Warm baths are then of great use; and extractum thebaicum, with or without magnesia, is useful in quieting the stomach and relieving the delirium. So much for the first or inflammatory period, which usually lasts about three days.

The second period is one of remission. The patient and his friends notice the improvement, and believe that all danger is passed. Now is the time to restore the forces. For this purpose give infusion of serpentaria, camphor, saffron, spirit of mindererus, acid elixir of vitriol, wine, and the vegetable acids. If there are hæmorrhages, use astringents: alumen and lead are good. Superficial coldness, syncopetic sweating, and

lassitude, may be combated by fomenting the body with aromatic spirits and sal-ammoniac. Authorities differ widely as to the use of vesicatories. Applied to the epigastrium, they are sometimes of service, after the first period of the disease. When there is no longer any obstruction in the liver, and the inflammatory symptoms have subsided, quinine will render great service. Dr. Romay does not consider the disease contagious.—*Crónica med.-quirurg. de la Habana*, No. 5, 1877. G. R. C.

Rare Variety of Heart-Disease.—Dr. Fr. Björnström reports (*Upsala läk. förk.*, Bd. ii) a congenital heart-defect occurring in a student twenty-three years of age, and bases his diagnosis of "insufficiency of the valves of the pulmonary artery" on the fact that a diastolic blowing sound is heard at the base of the heart, which is stronger at the left than at the right margin of the sternum, and is prolonged toward the right ventricle, which is dilated, but not toward the aorta and its branches. A distinct diastolic tone is heard, on the contrary, over the vessels of the neck. Sphygmographic curves show the dissimilarity of the pulse to that of insufficiency of the aortic valves.—*Nordiskt medicinskt Arkiv*, Bd. 8, H. 1. G. R. C.

Miscellany.

Appointments, Honors, etc.—Dr. Joseph D. Bryant has been appointed Lecturer on Anatomy in the Bellevue Hospital Medical College, in place of Prof. A. B. Crosby, deceased. Dr. L. M. Yale has been appointed Visiting Surgeon to Bellevue Hospital, to the vacancy occasioned by the death of Dr. A. B. Crosby. Dr. Edward C. Spitzka, of this city, has been awarded the "William and Samuel Tuke Prize" of one hundred guineas, by the Medico-Psychological Society of England, for the best essay on the Somatic Etiology of Insanity. Dr. Theodore H. Jewett, of South Berwick, Me., has been elected President of the Maine Medical Association for the ensuing year, and Dr. Charles O. Hunt, of Portland, Permanent Secretary. Dr. R. L. Parsons has resigned his position as Medical Superintendent of the New York City Lunatic Asylum, to accept a similar position in the Kings County Lunatic Asylum, Flatbush, L. I. Medical Inspector Delavan Bloodgood, U. S. A., has been detached from the Navy-Yard, New York, and ordered to the European station as surgeon of the fleet. Dr. W. W. Godding, Superintendent of the Lunatic Hospital at Taunton, Mass., has been appointed to the charge of the Government Hospital at Washington, D. C.

Dr. Erismann, a pupil of Pettenkofer, has been sent to the

seat of war by the Russian Government, and commissioned to take charge of the disinfection of the battle-fields. Dr. Isidor Schnabel, for many years first assistant of Prof. Arlt, in Vienna, has received the appointment of Professor of Ophthalmology in Innsbruck. Prof. W. H. Ellis, of Trinity Medical School, has been appointed Professor of Practical Chemistry in University College, Toronto. Dr. C. A. Wood, of Ottawa, has been appointed to the chair of Chemistry in Bishop's College, Montreal. Dr. Lachapelle has been appointed Professor of Hygiene, and Dr. Lamarche Professor of Histology and Microscopy, in the Victoria School of Medicine and Surgery, Montreal. Prof. Billroth has been to St. Petersburg to perform an operation. On the recommendation of Profs. Rokitansky, Virchow, and Leyden, the Cothenius Medal of the Leopold-Carolinian Academy has been awarded to Prof. Lister. Dr. Edward Warren has been created a Knight of the Order of Isabel the Catholic, as a recognition of the professional skill displayed by him in the successful treatment of some Spanish personages of high position.

American Dermatological Society.—The first regular meeting of this association was held at Niagara Falls, 4th to 6th ult., the President, Dr. J. C. White, of Boston, in the chair, and members being present from Baltimore, Boston, Chicago, Detroit, Louisville, New York, Philadelphia, and St. Louis. Papers were also received from Arkansas, and from London, England. The following officers were elected for the ensuing year: President, James C. White, of Boston; Vice-Presidents, Louis A. Duhring, of Philadelphia, R. W. Taylor, of New York; Secretary, L. Duncan Bulkley, of New York; Treasurer, James Nevins Hyde, of Chicago.

Death from Methylene and Ether.—A case of death is reported as having occurred in London, at the East Suffolk Hospital, during the administration of bichloride of methylene and ether, for the removal of diseased bone from the leg of a patient, aged fifty-six, who was suffering from syphilitic caries. Death occurred during a convulsion. The coroner refused a *post-mortem*, and consequently the immediate cause of death

was not ascertained. This combination of anæsthetics has been regarded as especially free from danger.

Ohio State Medical Society.—The thirty-second annual meeting was held June 12th–14th, Dr. W. J. Scott, President, in the chair. The following officers were elected: President, Dr. W. H. Phillips, Kenton, Ohio; Vice-Presidents, Drs. Forbes, Muscroft, Hubbard, Reed; Treasurer, S. S. Gray; Recording Secretary, J. W. Hallock; Assistant Secretary, J. F. Baldwin.

Rhode Island Medical Society.—At the last annual meeting of this Society the following officers were elected for the ensuing year: President, Dr. Charles H. Fisher, North Scituate; Vice-Presidents, Drs. Edward T. Casswell, and George P. P. Baker, Providence; Recording Secretary, Dr. W. E. Anthony, Providence; and Corresponding Secretary, Dr. E. M. Harris.

Deaths from Chloroform.—The *Medical Times and Gazette* of August 18th records a death from chloroform at the London Hospital, August 11th, and one at the Royal Ophthalmic Hospital, Moorfields, August 14th, from a mixture of chloroform and ether. Serious disease of the heart existed in both cases.

Testimonial to Señor Manuel Garcia.—A handsome service of plate, accompanied by an address, was presented to Señor Garcia in London, July 14th, by distinguished members of the aristocracy and of the various professions, as a recognition of the value of his invention of the laryngoscope in 1854.

A New Treatise on Practice.—The Messrs. Appleton & Co. have in press a work by Prof. Roberts Bartholow, on the practice of medicine, dealing chiefly with therapeutics. We judge from advance-sheets that the book will be one of great clinical value.

Correction.—By mistake, Fig. 5, in Dr. Robinson's article on "Sycosis," in the last number of the JOURNAL, was turned upside down.

Prof. Sayre abroad.—It must be exceedingly gratifying to Dr. Sayre to find his teachings so well received in England. He has been afforded ample opportunity for demonstrating his method of treating diseases of the spine, and seems to have made a deep and favorable impression on his audiences.

In a letter to the *Virginia Medical Monthly* for September, Dr. Didama, writing of Dr. Sayre's reception by the British Medical Association, says :

"Previous to the meeting at Manchester, he had, at Guy's, St. Thomas's, and other hospitals, applied the dressing to some sixty cases, with astonishing results. Some of these same patients had been unable to walk without support, and some even could not stand. But, within forty-eight hours, one delicate little child was able to run about and play. Sir James Paget remarked that, through the zeal of Prof. Sayre to advance a noble profession, he had accomplished that by which the sufferings of the hunchback of to-day were ended, and had blotted out the deformity for the future generations."

Of the meeting at Manchester the same correspondent says :

"For three hours the room was filled to suffocation with an intensely interested audience, and when the material for practical demonstrations was exhausted, and the meeting closed, cheer after cheer went up in one grand chorus as a slight testimonial of the appreciation for the words of instruction that had dropped from his lips. A vote of thanks was passed."

The *Lancet* gives a detailed account of Dr. Sayre's method of applying the plaster-bandage, and says of it :

"Time must elapse before we can judge fully of the value of this treatment, but already its power to relieve patients, to increase their height, and to improve their looks, is apparent, and it is to be hailed as a dispensation from that yoke of iron appliances which has been at once so unbearably irksome, costly, and useless."

The same journal thus describes the visit to Birmingham :

"The visit of Dr. Sayre to Birmingham, to give a demonstration at the Queen's Hospital of his method of treating curvature of the spine, was the occasion of a very large assemblage of practitioners and students in the operating theatre of that institution. The medical staffs of the General, Queen's, Orthopædic, and Children's Hospitals were represented, and

many of the surgeons had brought cases suitable for Dr. Sayre to demonstrate from. He selected two cases of lateral curvature and one of angular curvature for the application of the plaster-of-Paris bandage, and in all the cases the operation appeared to be well borne by the patients, and to afford them comfort rather than inconvenience. Each patient was accurately measured by independent parties prior to the use of the plaster apparatus and afterward, and each seemed to have gained in height, from half an inch to an inch and a half being added to their stature. Dr. Sayre's lecture, which occupied nearly two hours, was listened to with marked attention, his quaint, humorous manner of expression often eliciting loud applause, and his earnestness in enunciating the principles on which his treatment is founded convincing his audience of his thorough confidence in the efficacy of his system of treatment. At the conclusion of the demonstration a cordial vote of thanks was moved by Mr. West, seconded by Mr. Furneaux Jordan, and unanimously accorded to Dr. Sayre for his praiseworthy efforts to make his treatment generally known, and for his courtesy in paying a special visit to the midland district."

The distinguished visitor has been everywhere most hospitably entertained. A magnificent dinner was given in his honor in the Royal Hall of St. Bartholomew's Hospital, at which there were nearly four hundred guests present.

Sale vs. The Louisville Medical College.—At the request of the Faculty of this college, we publish the following extract from the July number of the *Chicago Medical Journal and Examiner*:

"Our readers who have noticed a report of this suit in the June number of this periodical may also hear '*alteram partem*.' Here is the account, as published over Dr. E. S. Gailard's signature, in the *Richmond and Louisville Medical Journal*:

"'In September last, Mr. Sale, a medical student and the plaintiff in this suit, entered the college mentioned. He paid his fees. A few weeks subsequently he was offered (with others) free tuition in a Louisville medical institution. This offer was a part of the sworn testimony of the plaintiff. He accepted it, and requested a return of his money. This request was of course not granted. He then asked for his tickets. He was told that this college never gave its tickets (the evidence of attendance upon a course of lectures) until the last

month of the course. Had the tickets been given there would have been no suit, but they were withheld, and the suit invited. The plea in this suit was failure to comply with promises made. In the garbled version of the magistrate's decision published in the *Courier-Journal*, and sent to the medical press everywhere, and to the alumni of the Louisville Medical College, it is admitted that this plea could not be, and had not been, sustained by the evidence. The so-called "judgment" of the magistrate was given on the ground that the present Faculty were not legally elected.

"The Book of Minutes of the Proceedings of the Board of Trustees shows that the members of the Faculty were not only legally elected by the present board, but that one of the last acts of the old board was to elect them (with one exception) before adjournment. It may be asked, Why was not this book produced, and such a "judgment" prevented? The answer is simple: it was in possession of the persecuted Secretary of the Board of Trustees, Dr. B. M. Wible, who was ill and soon after died, and was found after his death, and after the so-called "judgment" had been rendered, and copies of it forced into a daily paper (which never publishes the petty business of a magistrate's court), and actively disseminated for purposes too evident to require indication."

Physiological Action of Mancona-Bark.—From a careful examination of the bark of *Erythrophlæum guineense*, MM. N. Gallois and E. Hardy have arrived at the following conclusions: The bark of the *Erythrophlæum guineense*, employed by some of the natives of Western Africa to poison their arrows, and which belongs to the *Leguminosæ*, contains a toxic substance of considerable activity. This substance—for which they propose the name of "erythrophleine"—is a muscular poison, and especially a cardiac muscular poison, paralyzing the action of the heart more or less rapidly according to the dose administered. Warm-blooded animals die as soon as the heart is paralyzed, while in frogs life persists for a variable period. In animals poisoned with it the functions of the nervous system remain, to all appearance, long intact after the heart has ceased to beat. In the dose of one-half to one milligramme placed directly on the heart, or of two milligrammes subcutaneously injected, erythrophleine stops the heart of a frog in from five to eight minutes; four milligrammes injected beneath the skin of a Guinea-pig proves fatal in the course of a few hours; and four centigrammes, in divided doses, killed a curarized dog of moderate size in one hour and a half. In warm-blooded animals it produces convulsions and extreme

dyspnœa, consecutive upon disorders of hæmatosis. In cold-blooded animals it produces progressive stupefaction, which leads to complete resolution of the muscles. The heart is paralyzed before either the smooth or striated muscles, consequent on the large volume of blood with which it comes into contact in a given time. In frogs the ventricle stops in systole, the auricles in diastole. In warm-blooded animals the heart is usually found soft and filled with blood, and the poison can be demonstrated by chemical tests in the blood. In the frog the heart beats slowly before stopping, but in the dog its action is considerably accelerated. In the three dogs operated on the arterial tension was found to be augmented. Atropine does not reanimate the heart; curara retards its effects. It is difficult, the authors observe, to say whether manconabark will ever be introduced into practice. If sternutatories were still employed, it would certainly take its place among them; and it may be observed that, like digitalis, it augments arterial tension.—*Lancet*.

Army Intelligence.

Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from August 14 to September 13, 1877.

NORRIS, B., Major and Surgeon.—Granted leave of absence for one month. S. O. 186, A. G. O., September 1, 1877.

ALDEN, C. H., Major and Surgeon.—On account of illness, relieved from duty as chief surgeon of reserve, column of troops of the Nez Percés Indian Expedition. S. O. 113, Department of the Columbia, August 11, 1877. And to join his proper station, Fort Townsend, W. T. S. O. 117, Department of the Columbia, August 16, 1877.

STERNBERG, G. M., Major and Surgeon.—To take charge of the sick and wounded at Camp Bancroft, Idaho T., proceed with them to Grangeville, Idaho T., and there establish a field hospital. S. F. O. 28, headquarters Department of the Columbia, in the field, July 14, 1877.

MCCLELLAN, E., Major and Surgeon.—Relieved from duty in the Department of the South, and to report in person without delay to the commanding general, Department of the Columbia, for duty. S. O. 185, A. G. O., August 31, 1877.

GREENLEAF, C. R., Major and Surgeon.—Relieved from duty in Department of the Gulf, and to report to commanding general, Division of the

Atlantic, for instructions, with view to accompany the Third Infantry to the West. S. O. 188, A. G. O., September 4, 1877.

GARDNER, W. H., Captain and Assistant Surgeon.—To proceed to Greenville, S. C., for purpose of looking after medical property, and then rejoin his station, Allegheny Arsenal, Pittsburg, Pa. S. O. 197, Division of the Atlantic, August 28, 1877.

SMART, CHARLES, Captain and Assistant Surgeon.—To proceed at once, from Camp Douglas, U. T., to Camp Brown, Wy. T., and report to Colonel Merritt, Fifth Cavalry, for field service. S. O. 109, Department of the Platte, August 31, 1877.

KINSMAN, J. H., Captain and Assistant Surgeon.—Relieved from duty in Department of the Gulf, and, at expiration of his present leave of absence, to report in person to commanding general, Division of the Atlantic, for assignment. S. O. 188, C. S., A. G. O.

DE WITT, C., Captain and Assistant Surgeon.—Assigned to temporary duty at Fort Fred Steele, Wy. T. S. O. 107, Department of the Platte, August 28, 1877.

DE HANNE, J. V., Captain and Assistant Surgeon.—Assigned to duty as Post-Surgeon at Fort Concho, Texas. S. O. 153, Department of Texas, August 27, 1877.

FITZGERALD, J. A., Captain and Assistant Surgeon.—Upon arrival of Surgeon Sternberg at Fort Lapwai, Idaho T., to transfer to him the medical property of the post, and then report without delay to the commanding general of the department in person, in the field. S. F. O. 34, headquarters Department of the Columbia, in the field, July 22, 1877.

KIMBALL, J. P., Captain and Assistant Surgeon.—Relieved from duty at Fort Brady, Mich., to proceed to New York City, and report in person at these headquarters for assignment. S. O. 190, Division of the Atlantic, August 22, 1877.

KING, J. H. T., Captain and Assistant Surgeon.—When relieved by Assistant Surgeon De Hanne, to proceed to Fort Clark, Texas, and report to the post-commander for duty as post-surgeon. S. O. 153, C. S., Department of Texas.

DICKSON, J. M., Captain and Assistant Surgeon.—Relieved from duty in Department of the Gulf, and assigned to duty in Division of the Atlantic. S. O. 172, A. G. O., August 14, 1877. And assigned to duty with U. S. troops, Indianapolis Arsenal, Ind. S. O. 190, C. S., Division of the Atlantic.

REYNOLDS, F., Captain and Assistant Surgeon.—Granted leave of absence for six months, from September 1, 1877, on Surgeon's certificate of disability, with permission to go beyond sea. S. O. 177, A. G. O., August 20, 1877.

PAULDING, H. O., First-Lieutenant and Assistant Surgeon.—Relieved from duty at Fort Ellis, M. T., and, upon conclusion of summer's campaign, to accompany Seventh Cavalry to Fort A. Lincoln, D. T., reporting to the commanding officer of that post for duty. S. O. 113, Department of Dakota, August 21, 1877.

BROWN, P. R., First-Lieutenant and Assistant Surgeon.—Upon arrival of A. A. Surgeon Redd at cantonment on Tongue River, to be relieved from duty with Fifth Infantry, and return to his station, Fort Shaw, M. T. S. O. 108, Department of Dakota, April 13, 1877.

HALL, WM. R., First-Lieutenant and Assistant Surgeon.—Assigned to duty at Camp Macbeth, Kamiah, Idaho T. S. F. O. 31, headquarters Department of the Columbia, in the field, July 18, 1877.

TAYLOR, M. E., First-Lieutenant and Assistant Surgeon.—To proceed to Baton Rouge Barracks, La., for purpose of looking after medical property, and then rejoin his station, Wilkesbarre, Pa. S. O. 197, C. S. Division of the Atlantic.

GARDNER, E. F., First-Lieutenant and Assistant Surgeon.—Relieved from duty at Fort A. Lincoln, D. T., and assigned to duty at Fort Ellis, M. T. S. O. 113, C. S., Department of Dakota.

CORBUSIER, W. H., First-Lieutenant and Assistant Surgeon.—To proceed to Chattanooga, Tenn., for purpose of looking after medical property, and then rejoin his station, Jeffersonville, Ind. S. O. 197, C. S., Division of the Atlantic.

ROBINSON, S. Q., First-Lieutenant and Assistant Surgeon.—Relieved from duty in Department of West Point, and to accompany the Third Infantry to the West. S. O. 186, A. G. O., September 1, 1877.

DAVIS, WM. B., First-Lieutenant and Assistant Surgeon.—Relieved from duty at St. Louis Barracks, Mo., and to report in person to commanding general, Department of Dakota, for assignment. S. O. 185, C. S., A. G. O.

Obituary.

DR. SAMUEL WARREN.—The decease of the author of the "Diary of a Late Physician" cannot be allowed to pass without regretful remark. Mr. Samuel Warren was made Master in Lunacy in 1859, and has not of late years been much before the reading public. His last considerable work was a novel—"Ten Thousand a Year"—but it is by the "Diary" he will be remembered. When a student of medicine at Edinburgh University, nearly half a century ago, Mr. Warren obtained that acquaintance with the more personal aspects of our profession which he evinced throughout the series of papers in *Blackwood*, afterward published as the "Diary." It is impossible not to lament the loss of one who will live in memory as a rare exemplar of the art which produces pictures in words.—*Lancet*.

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NOVEMBER, 1877.

[No. 5.

Original Communications.

ART. I.—*Experiments on the Effects upon Respiration of cutting off the Supply of Blood from the Brain and Medulla Oblongata.* By AUSTIN FLINT, Jr., M. D., Professor of Physiology in the Bellevue Hospital Medical College, New York, etc.

IN October, 1861, I published in the *American Journal of the Medical Sciences* a paper on "Points connected with the Action of the Heart and with Respiration." In this paper; I contended that the respiratory sense (*besoin de respirer*, of the French), or sense of want of air, which gives rise to the movements of respiration, is due to a want of oxygen in the general system. I assumed that the medulla oblongata is the centre presiding over the respiratory movements; that these movements are reflex; that a certain sense, called the respiratory sense, is conveyed to the medulla oblongata; and that it is this sense which is the starting-point of the respiratory acts. I showed that a dog brought under the influence of ether, with the heart and lungs exposed and with a bellows in the trachea, will make no respiratory efforts so long as air is efficiently supplied to the lungs by artificial respiration, an experiment essentially the same as one made

by Robert Hook, in 1664. In an animal in this condition, I showed that respiratory efforts were made, when artificial respiration was interrupted, as soon as the blood became dark in the arteries, having opened an artery and noted the color of the blood as the experiment progressed.

It seemed to me at that time that the sense of want of air in this experiment was due to the properties of the dark-colored blood circulating in the arterial system; and the question arose in my mind whether this were dependent upon the deficiency of oxygen in the blood or upon the presence of carbonic acid. In order to answer this question, I drained an animal (a good-sized dog) of blood by dividing the femoral artery, the chest having been opened with the animal under the influence of ether, and artificial respiration being maintained in the usual way. In this experiment, although the lungs were constantly supplied with air, violent respiratory efforts were made as the animal became nearly exsanguine.

In another experiment, I divided both pneumogastric nerves and ascertained that there was no difference in the phenomena observed, showing that these nerves are not the sole conductors of the sense of want of air, if, indeed, they have any part in this function. In still another experiment, I drained an animal of blood by cutting out the heart. This was followed by violent respiratory efforts, showing that the sense of want of air has nothing to do with distention of the right cardiac cavities.

From the experiments of which I have thus given a brief sketch, made in 1861, I concluded that the sense of want of air, or the respiratory sense, was due to a want of oxygen in the general system, producing an impression which was conveyed to the medulla oblongata and which gave rise to respiratory efforts; that, in ordinary respiration, this reflex action took place unconsciously, but became exaggerated when there was a great deficiency of oxygen, and was then experienced as a sense of suffocation; that the respiratory sense thus had its origin in the general system and had nothing to do with the lungs, as the sense of thirst has its seat in the general system, from deficiency of water, and has simply a local manifestation in dryness of the throat and fauces. In addition to the ex-

perimental arguments in favor of this view, I saw, in cases of distress in breathing from deficient circulation, as in certain cases of disease of the heart in which the lungs are normal, what seemed to me to be a confirmation of my opinion.

The views which I have just stated were advanced by me in my work, "Physiology of Man," New York, 1866, vol. i., page 479, *et seq.*, and in my "Text-Book of Human Physiology," New York, 1876, page 164, *et seq.* In February, 1874, I made an address before the New York Society of Neurology and Electrology upon the "Mechanism of Reflex Nervous Action in Normal Respiration," an abstract of which was published in the NEW YORK MEDICAL JOURNAL, in April of the same year. The full text of this address was published in the *Chicago Journal of Nervous and Mental Diseases*, in April, 1874. In this, I still adhered to my original view, and I extended my reflections to the theory of the cause of the first respiration at birth, respiration by means of the placenta *in utero*, etc.

At the present day nearly all physiological writers agree that the sense of want of air is due to want of oxygen, and not to any stimulating or irritating properties of carbonic acid; and this idea has received complete confirmation from the experiments of Pflüger upon the effects of respiration of nitrogen, as is seen by the following extract:

"Using bloodletting for ascertaining the condition of the blood during dyspnœa, I arrived at the following facts: As soon as the dog begins to breathe pure nitrogen, it is scarcely fifteen seconds before he makes violent and deep inspirations; at the end of thirty seconds, the most intense dyspnœa is observed, the blood is already almost absolutely black, which must be due to the enormously-rapid tissue-metamorphosis of this animal."¹

It is seen that this experiment, made in 1868, is almost identical in its idea and results with those which I made in 1861, except that Pflüger made his animal breathe a gas not capable of supporting respiration, while I simply deprived animals of air. Nearly the same experiment as that per-

¹ Pflüger, "Ueber die Ursache der Athembewegungen, sowie der Dyspnœe und Apnœe."—*Archiv für die gesammte Physiologie*, Bonn, 1868 Bd. i., S. 89.

formed by Pflüger was made by Rosenthal, in 1862, who noted that animals suffered no dyspnœa when air or oxygen was forced through the lungs, but that dyspnœa was manifested when nitrogen or hydrogen was used instead of oxygen.¹

While physiologists are now pretty generally agreed that the sense of want of air is connected with a deficiency of oxygen in the blood of the arteries, some writers are of the opinion that the "sense" is primarily due to a want of oxygenated blood circulating in the medulla oblongata. This opinion has been advanced by some authors, but, as far as I know, it rests mainly upon theory, and has no positive experimental foundation. Since I made the experiments which form the basis of this article, I have consulted a number of systematic works upon physiology, with reference to the subject under consideration. Most of the works examined contain no very definite allusions to the respiratory sense, or at most only brief and unsatisfactory statements; but, in two, I find the following references, which are directly pertinent to the question:

"The first respiratory effort of the fetus is thus produced by the interruption of the placental respiration, the sudden deficiency of oxygen and increase of carbonic acid in the blood (Schwartz). This change in the blood needs to take place locally only in the vessels of the medulla oblongata, in order to produce this effect; it occurs, for example, from arrest of the blood in these vessels (by ligature of the carotid arteries, Kussmaul and Tenner, Rosenthal, or by closure of the venous currents from the brain, Hermann and Escher), by which their blood becomes progressively poorer in oxygen and richer in carbonic acid" (Hermann, "Grundriss der Physiologie des Menschen," Berlin, 1870, S. 160).

"If the supply of blood be cut off from the medulla by ligature of the blood-vessels of the neck, dyspnœa is produced, though the operation produces no change in the blood generally, but simply affects the respiratory condition of the medulla itself, by cutting off its blood-supply, the immediate result of which is an accumulation of carbonic acid and a paucity of available oxygen in the protoplasm of the nerve-cells in that region" (Foster, "A Text-Book of Physiology," London, 1877, p. 254).

These quotations from Hermann and from Foster show clearly that their idea is, that the sense of want of air is due to deficiency of oxygenated blood in the medulla oblongata, a

¹ Rosenthal, "Athembewegungen," etc., Berlin, 1862, S. 4.

view fully sustained by my own experiments. The observations of Kussmaul and Tenner, referred to by Hermann, were made with reference to the cause of the convulsions which so often occur after profuse and sudden hæmorrhage. They are to be found in the elaborate memoir by Kussmaul and Tenner, "On the Nature and Origin of Epileptiform Convulsions caused by Profuse Bleeding," translated and published by the "New Sydenham Society," in 1859. Kussmaul and Tenner made a large number of experiments upon rabbits and horses, in which they observed the effects of tying the great vessels given off from the arch of the aorta. They noted, after this operation, great difficulty in respiration and violent convulsions. They did not, however, abolish the respiratory movements of the animal by artificial respiration, thus abolishing, for the time, the respiratory sense, and then note the effects of ligature of these vessels. The experiments by Rosenthal, which are referred to, are probably those contained in his work on "*Die Athembewegungen und ihre Beziehungen zum Nervus Vagus*," Berlin, 1862. In these experiments, as I have already stated, it is shown that the respiratory efforts of an animal can be abolished by forcing atmospheric air or oxygen in large quantities through the lungs, but that the sense of want of air is felt when, in place of oxygen, nitrogen or hydrogen is employed, by this means removing the possibility of an irritation from carbonic acid. These are essentially the same as the observations made by Pflüger, in 1868. Rosenthal states very distinctly that the sense of want of air is due to want of oxygen—carrying blood in the medulla oblongata; but he does not actually demonstrate the truth of this proposition by experiments. The statements by Hermann and by Foster are apparently based upon the experiments of Kussmaul and Tenner and of Rosenthal; but I must nevertheless claim that the experiments which I have made upon this subject, which will be detailed farther on, if they should be confirmed, afford the first positive proof that the respiratory sense may be excited by cutting off the arterial supply from the medulla. There is nothing which I can find, in the experiments of Kussmaul and Tenner or of Rosenthal, to actually show that the sense of

want of air is not due to a want of oxygen in the general system.

In reflecting upon this subject during the last few months, it occurred to my mind that the question was capable of a positive solution by experiment. If it be possible to cut off the arterial supply to the head and medulla oblongata, leaving the rest of the circulation free, an animal should make respiratory efforts, even though air be supplied to the lungs, provided that the sense of want of air be due to a want of oxygenated blood in the medulla. On the other hand, if the sense of want of air be due to a want of oxygen in the general system, cutting off the arterial supply from the head and medulla would have no more effect than cutting off the supply of oxygen from any other equally extensive part of the system. In reducing this idea to the project of an actual experiment, I conceived the following: I proposed to tie all the vessels that could by any means supply the medulla oblongata with blood (the vessels given off from the arch of the aorta), and note the effects; and then to tie the descending aorta in the chest, and note the effects, leaving the vessels coming from the arch of the aorta free. It seemed to me that, if the respiratory sense were due to want of oxygen in the general system, tying the aorta in the chest would induce respiratory efforts certainly as promptly as cutting off the arterial supply from the medulla. With the view of settling this question, if possible, I made the following experiments, which, as far as they go, are exceedingly definite and satisfactory in their results. I propose, however, to extend these experiments, and I publish them now simply as preliminary to farther investigations into the subject under consideration:

EXPERIMENT I., *September 30, 1877.*—A medium-sized, full-grown dog was brought completely under the influence of ether. The trachea was then opened and connected with a bellows, and artificial respiration was maintained. Over the valve of the bellows was placed a sponge, which was saturated with ether from time to time, so that the animal was kept completely anesthetized during the experiment. The air in the bellows was also changed from time to time by pushing up the valve with the fingers and forcing out the vitiated air. The chest and abdomen were then laid open

by a continuous incision in the median line, and the ribs were bent backward and secured with a strong cord tied behind the back, so that the lungs and heart were fully exposed. The pericardium was then cut away, the great vessels near the heart were isolated, and loose ligatures were thrown around the trunk of the innominate artery, the left subclavian artery, the descending vena cava, the descending portion of the aorta, and the ascending vena cava.¹ In this way, I was prepared to constrict the several vessels at will.

When these preliminary steps had been completed, the animal being entirely under the influence of ether and artificial respiration being kept up efficiently, there were absolutely no respiratory efforts, and the diaphragm, which was exposed, was quiescent.

The artificial respiration was then arrested. In forty-five seconds, the animal began to make violent respiratory efforts. Artificial respiration was then resumed, and the respiratory efforts of the animal ceased. When the artificial respiration was arrested, we first noticed a movement of the corners of the mouth at regular intervals, and then the mouth was widely opened and the diaphragm became strongly contracted, also at regular intervals. The time was taken at the first violent respiratory effort.

The animal being perfectly quiet and making no efforts at respiration, the innominate artery, the left subclavian artery, and the descending vena cava, were tied nearly simultaneously, artificial respiration being constantly and efficiently maintained. In two minutes and eight seconds, the animal began to make respiratory efforts, which continued as long as the vessels remained constricted.

The ligatures surrounding the vessels mentioned above were loosened five minutes and twenty-two seconds after they had been tied, and the respiratory efforts of the animal instantly ceased. After three minutes, artificial respiration was stopped, and the animal began to make respiratory efforts in thirty-nine and a half seconds, which ceased as soon as artificial respiration was resumed.

The descending aorta and the ascending vena cava in the chest were then tied simultaneously, the vessels arising from the arch of the aorta being free. This seemed to produce no effect, and no respiratory efforts were made by the animal for five minutes. The innominate artery and the left sub-

¹ In the dog, the aorta gives off the innominate artery "which gives off first the left carotid, and then divides into the right subclavian and right carotid" (Foster, "Elementary Practical Physiology," London, 1876, p. 13). The left subclavian artery arises directly from the aorta.

clavian artery were then constricted, the aorta and ascending vena cava remaining tied. Respiratory efforts by the animal began in one minute and twenty-six seconds, although artificial respiration was maintained. These efforts ceased when the ligatures around the innominate and subclavian were loosened.

The ligatures were then removed from the descending aorta and ascending vena cava, and the innominate and left subclavian arteries were constricted, which was followed by respiratory efforts after one minute and six seconds. These efforts ceased when the vessels were freed.

The innominate artery alone was then constricted, but this seemed to produce no effect, no respiratory efforts being made by the animal for five minutes. At the end of five minutes, the left subclavian artery was constricted, the constriction of the innominate artery being maintained. The animal began to make respiratory efforts fifty-three seconds after constriction of the subclavian. These efforts ceased on loosening the ligatures.

Artificial respiration was then stopped, and the animal began to make respiratory efforts in ten seconds. The medulla oblongata was then broken up, and the experiment was concluded.

In this experiment I had the aid of my able assistant, Dr. C. F. Roberts, and of Mr. Gaspar Griswold, an advanced laboratory student. As the experiment progressed, it was ascertained that the vessels could be effectually constricted by making traction on the ligatures without tying. The constriction could then be instantly removed. It was also ascertained that constriction of the veins made no difference in the phenomena observed.

EXPERIMENT II., *October 2, 1877.*—A medium-sized, full-grown dog was brought completely under the influence of ether. A bellows was fixed in the trachea and the chest and abdomen were opened as in the preceding experiment. These preliminary steps were completed at 11.30 A. M. Artificial respiration, which had been kept up with the bellows, was arrested, and the animal made efforts at respiration in thirty-seven and three-fifths seconds, having previously been quiet. The innominate artery and the left subclavian artery were then constricted, the artificial respiration being continued, and the animal made respiratory efforts in two minutes and five seconds, having previously been rendered quiet by artificial respiration. After a few respiratory efforts, the ligatures were loosened, and the animal became perfectly quiet, artificial respiration being continued. While the animal was per-

fectly quiet, artificial respiration being continued, the descending aorta was tied in the chest. The aorta was constricted for five minutes, and no effect was observed, artificial respiration being maintained, and the animal remaining perfectly quiet. The heart was then cut out, the system being thus drained of blood, and the animal made respiratory efforts in twenty-five seconds.

This experiment was a public demonstration made in a lecture before the class at the Bellevue Hospital Medical College; and I was assisted by Dr. C. F. Roberts, Mr. Gaspar Griswold, Dr. G. S. Conant, and Mr. W. L. Wardwell. The experiment was essentially a repetition of Experiment I., and the results of the two observations were nearly identical.

The two experiments just detailed show that ligature of the aorta has no sensible effect upon respiration; but that ligature of all the vessels given off from the arch of the aorta, which, it would seem, must cut off the supply of oxygenated blood from the brain and the medulla oblongata, produces a sense of want of air, which gives rise to respiratory efforts, even while artificial respiration is efficiently maintained. It seems, from the results observed in Experiment I., that it is not enough to tie the innominate artery, which is equivalent to tying the two common carotids and the right subclavian artery, but that it is also necessary to tie the left subclavian artery. This is explained by the fact that the left subclavian gives off the vertebral artery, which empties into the basilar artery, and thus carries oxygenated blood to the medulla oblongata.

Taking into account the fact that the sole respiratory nervous centre is situated in the medulla oblongata, the two experiments which I have described, as far as they go, seem to show conclusively that the sense of want of air is due to a deficiency of oxygenated blood in the medulla oblongata, and that this sense is satisfied by the circulation of such blood in the respiratory nervous centre.

EXPERIMENT III., *October 7, 1877.*—A full-grown young dog, weighing about thirty pounds, was brought completely under the influence of ether at 10.45 A. M., a bellows was fixed in the trachea, and the chest and abdomen were opened as in the preceding experiments. The vessels given off from the arch of the aorta were then carefully dissected out, and loose

ligatures were thrown around the innominate artery, the two carotids, the right subclavian artery, the right vertebral artery, the left subclavian artery, and the left vertebral artery. These ligatures were placed around the vessels so that they might be readily found in the course of the experiment, but the vessels were not thereby constricted.

After these preparatory steps had been completed, artificial respiration was arrested, and the animal began to make respiratory efforts in thirty seconds. Artificial respiration was then resumed, and the animal became quiet.

The two subclavian arteries were then constricted with *serre-fines*, which, it was ascertained, arrested the blood-current completely. The animal remained quiet for five minutes, making no respiratory efforts. The subclavians remaining constricted, both carotids were then constricted in addition. The animal made respiratory efforts in two minutes and seven seconds after constriction of the carotids. All the vessels were then freed, and the animal became quiet.

Both vertebral arteries and both carotids were then constricted for five minutes, the animal remaining quiet. These vessels remaining constricted, both subclavian arteries were constricted in addition. The animal made respiratory efforts in one minute and thirty-five seconds. All the vessels were then freed, and the animal became quiet.

At 11.40 o'clock, the descending aorta in the chest and both subclavian arteries were tied. This left little more than the carotids to carry blood to the head, and the arterial blood was thus cut off from the greatest part of the system. The animal remained quiet for five minutes. The experiment had now lasted fifty-five minutes, and the action of the heart had become considerably weakened. While the aorta and subclavians were still constricted, both carotids were constricted in addition. The animal remained quiet for five minutes, but the heart and the great vessels up to the points of constriction were enormously distended. At the end of this time, the aorta was freed, which relieved the distention. The animal made respiratory efforts in two minutes and twenty-nine seconds, but the efforts were not very violent and were not as rapid as usual. All the vessels were freed, and the animal became quiet.

Artificial respiration was then arrested, and the animal made respiratory efforts in twelve seconds. Artificial respiration was resumed, and the animal became quiet.

The innominate artery and the left subclavian artery were then constricted, and the animal made respiratory efforts in one minute and fifteen seconds, but the action of the heart had become very feeble.

The experiment had lasted one hour and fifteen minutes, and was concluded with the last observation.

In this experiment, I was assisted by Dr. C. F. Roberts, Mr. Gaspar Griswold, and Dr. G. S. Conant.

This experiment substantially confirmed the results obtained in Experiments I. and II. When the aorta, both subclavian arteries, and both carotids, were constricted, the pressure of blood in these vessels was enormous, and some blood may have found its way to the brain and medulla oblongata. The distention of the vessels was so great that this part of the experiment was not very satisfactory. Respiratory efforts were made by the animal, however, when the distention was relieved by freeing the aorta, the subclavians and the carotids remaining constricted.

In all the experiments, the animals were kept completely under the influence of ether, and artificial respiration was kept up efficiently unless otherwise stated.

Deductions and Conclusions.—When I made my first experiments upon the location of the sense of want of air which gives rise to respiratory movements, in 1861, I attached to them considerable importance, and I thought that I had proved experimentally that the sense of want of air is due to a deficiency in oxygen in the system at large. The main features of the experiments which I made at that time I have already stated. My object in making these new experiments was to study the effects of cutting off the supply of oxygenated blood from different parts.

I think it can be assumed, as I have already stated, that the sole respiratory nervous centre is in the medulla oblongata, and I endeavored to devise some means of cutting off the arterial supply of blood from this part. Animals respire when all of the encephalic centres have been destroyed except the medulla oblongata, so that it is improbable that cutting off the supply of blood from the brain would affect the muscles of respiration, provided that artificial respiration be efficiently maintained. Blood can get to the medulla oblongata from the internal carotids, which are connected with the circle of Willis, from the vertebral arteries, which unite to form the

basilar artery,¹ and perhaps from other vessels; but it is certain that, if all the arteries given off from the arch of the aorta be tied, the medulla must be deprived of oxygenated blood.

In Experiment I., the innominate artery and the left subclavian artery were constricted,² and the animal made respiratory efforts in two minutes and eight seconds, notwithstanding that artificial respiration was kept up.

In Experiment II., the same vessels were constricted, and the animal made respiratory efforts in two minutes and five seconds.

In Experiment III., both subclavian arteries and both carotids were constricted, and the animal made respiratory efforts in two minutes and seven seconds. Both vertebral arteries and both carotids were constricted, and the animal made no respiratory efforts for five minutes; but respiratory efforts were made in one minute and thirty-five seconds after both subclavians had been constricted in addition to the vertebrals and carotids.

It seems, from all of these experiments, that, in order to induce respiratory efforts in an animal under the influence of ether and with the lungs supplied with air by artificial respiration, either the innominate artery and the left subclavian artery, or both subclavians, both carotids, and both vertebral arteries, must be tied. In other words, according to my view of the cause of these respiratory efforts, the supply of blood to the medulla oblongata cannot be cut off completely except by tying all the vessels given off from the arch of the aorta.

As the result of the experiments which I have just detailed, I must now modify the view which I advanced in 1861 as a conclusion from experiments then published, which I have maintained up to the present time, that the sense of want of air, which is the starting-point of the movements of respiration, is due to want of oxygen in the general system. My experiments made in 1861 were accurate,

¹ The basilar artery is much longer in the dog than in the human subject.

² In the first experiment, the great veins were also tied, but this seemed to make no difference in the phenomena following constriction of the arteries, and the veins were left free in the other experiments.

and the conclusions from them seemed to be legitimate; but these experiments were incomplete. The experiments which I have just reported, taken in connection with my experiments of 1861, lead me to conclude that the sense of want of air is due to a want of circulation of oxygenated blood in the medulla oblongata.

I trust that my experiments, which are by no means difficult, or uncertain in their results, may be repeated and either verified or corrected, by other physiologists. The idea that the sense of want of air is due to a deficiency of oxygen in the medulla has been adopted by some writers; but, as far as I know, my experiments are the first to show, by actual demonstration, that this view is correct.

In another paper, I propose to treat of the respiratory sense much more fully, and to review the literature of the subject. Many interesting and important points will undoubtedly be involved in a full discussion of the nervous mechanism of the respiratory movements; and among them will be the question as to whether the normal respiratory movements be actually reflex in their character, as has been generally supposed, or whether they be due to a direct excitation of the nerve-cells in the respiratory centre.

ART. II.—*Pyæmia and Septicæmia*.¹ By B. A. WATSON, M. D., Surgeon to the Jersey City Charity and St. Francis Hospitals, Jersey City, N. J.

[Concluded from October Number.]

IV. ETIOLOGY. 1. *Pyæmia*.—It is said by Billroth that "the term septicæmia essentially depends on the etiology,"² and the same remark would apply with equal force to the term pyæmia. The latter term was first used by Piorry, and the disease is supposed to be due to the absorption of pus, or its constituents, into the blood. In fact, if we use the term pyæmia in the restricted sense in which it is now commonly

¹ President's Address before the New Jersey Academy of Medicine at its Annual Meeting, June 20, 1877.

² "Surgical Pathology," p. 336.

employed by German and American authors, then it may be safely asserted that the origin of the disease has been *fully demonstrated* by an almost unlimited number of experiments. That pus, or some of its elements, produces this condition, is not denied by any observer; but there are many disputed points bearing on this question, and I regret that, for the present, I shall be obliged to limit myself by merely mentioning the same without giving either the experiments or arguments relating to them.

The injection of pus into living animals produces local, remote, and constitutional symptoms. The character of these symptoms depends largely on the kind of pus, laudable or ichorous, the quantity injected, and the site of injection. It will be readily perceived that, in cases where the pus is directly thrown into a vein, the local symptoms would be unimportant, while the danger of remote trouble—metastatic abscesses in the lungs, liver, etc.—would be very great; but, should the injection be made into the connective tissue, then the relations would be reversed. Constitutional symptoms may exist in both cases, but will differ in character and degree. In regard to the character of the pus, and its agency in the production of this disease, Billroth says: "The old view, that pyæmia is only induced when decomposed pus (ichor) is reabsorbed, is entirely erroneous. There are cases where decomposed, putrid pus enters the blood, and which present a combination of the symptoms of septicæmia and pyæmia (septo-pyæmia of Heuter)."¹

Dupuytren failed to produce metastasis by injections of pus into the veins of dogs; these results were confirmed by Boyer, who only obtained metastasis when he used ichorous pus in his experiments. The same results are recorded in the works of Günther and Sédillot, based on numerous experiments. Beck made fourteen experiments, very carefully, but did not succeed in producing metastasis in a single case. The same results are recorded by a commission of the Physiological Society of Edinburgh. O. Weber has recently shown, by extended experiments, that carefully-filtered pus will not produce metastatic abscesses in the lungs. Therefore it may

¹ "Surgical Pathology," p. 344.

be considered as proved that *fluid pus injected into the veins of an animal produces no metastatic points of inflammation*. It should not be supposed, however, that because injections of fresh (non-ichorous) pus failed to produce metastatic abscesses, it was therefore without results, as the earlier experimenters thought. Billroth and O. Weber have shown, by their recent experiments, that these injections are uniformly followed by fever, and if subcutaneous, by abscess; and further, that injections of fresh pus produce even a higher temperature than the ichorous; but the pus taken from cold abscesses has apparently very slight effects. The fresh, non-ichorous, dried pus was found to possess in a similar degree the power to excite inflammation and suppuration; even the removal of the albumen did not change its character or power. It will be observed that these injections caused not only local inflammation, but severe constitutional symptoms, as high temperature, etc. Unfortunately, thus far all the experiments made have completely failed to show the agent that excites the inflammation, although it is generally admitted that it exists, at least, in the molecular bodies. Virchow and Panum have shown conclusively, by their experiments on living animals, that the introduction of foreign bodies into veins—as powdered coal, wax-balls, and quicksilver—fail in all cases to produce metastatic abscesses in the visceral organs, or other symptoms of pyæmia. These foreign bodies were frequently found blocking up the terminal branches of the pulmonary artery, in some cases encapsuled; frequently resembling miliary tubercles, and occasionally surrounded by evidences of slight local inflammation, but in every instance without suppuration. The same experimenters, however, observed that the introduction of ichorous pus and decomposing animal tissue into the veins was attended with the formation of metastatic abscesses and other symptoms of pyæmia. They therefore conclude that the introduction of putrid animal substances into the veins and the further transport of the same to the branches of the pulmonary artery, produce metastatic abscesses, and that the origin of these deposits is independent of the mere stopping up of the branches of this artery. The occlusion of the blood-vessels

in this diseased condition is a subject which has given rise to much discussion. Some of the earlier writers supposed this phenomenon constituted the disease pyæmia, while others believed it to be the essential cause. Prof. Roser says, "But the thrombus is, as can be easily proved, not the cause but only a symptom of pyæmia. If a surgical patient, e. g., one suffering with an injury of the head, is attacked by inflammation and occlusion of a large vein, perhaps the common iliac, then there are three different theories for the inflammation of the occluded vein, viz., Hunter's, Rokitansky's, and Virchow's. According to the old Hunterian phlebitic theory, the coagulation of the blood should be a result of the inflammation of the vein. On account of the circumstances under which the coagulation in the vein should have occurred, one represents that the cause must be an oozing of coagulable exudation from the inflamed walls of the vein. But pathological dissections, especially Rokitansky's, would not accord with it. Large veins were found plugged up without the existence of corresponding indications of inflammation, and frequently perfectly clear indications that occlusion preceded the inflammation. Consequently the occlusion of the vein was the primary condition, and this must be explained in some other way than by its inflammation. Rokitansky, in his theory, recognized an independent disease of the blood. Certainly, had these diseased conditions of the blood been examined into, it would have supplied no theory for the explanation of the preceding facts. If it is recognized as correct that a primary disease of the blood is to be admitted, yet the coagulation of the blood in a large vein has not been traced back to it. It remained wholly unexplained why a single vein, especially one so large and strong as the common iliac, should become the seat of the local coagulation. The necessity of finding a local basis for the local coagulation could not be denied. For that reason it was greeted as a highly-desirable advance when Virchow pointed out that the occlusion of such large veins could be dependent on the coagulation of the blood in the concave spaces behind the valves of the veins, or through the coagulation in the small branches, e. g., the hypogastric vein, which is gradually

carried forward until it reaches the common iliac, and by the continual increase this vein also may be filled up. At the same time it was demonstrated that not unfrequently, much oftener than was formerly supposed, the coagulated masses of blood are broken up and carried further on in the circulation, in this manner producing occlusion of the pulmonary artery or its branches.”¹ The examination of this subject finally brings Prof. Roser to this conclusion: “Contamination of the blood is essentially the primary cause of pyæmia; thrombosis is only a result of this morbid contamination, and cannot therefore be regarded as the cause of pyæmia—but only as an apparent part, as one of the symptoms of the same.”² The opinion here expressed by Prof. Roser I believe to be the one generally entertained by the profession at this time. This fact being admitted, the most important question presenting itself for our examination is, “How is this contamination of the blood produced?” A complete investigation of this subject would require the presentation of the entire subject of “Disease Germs; their Nature and Origin.” I shall not venture to enter on this disputed field, but shall confine myself strictly to that form of the disease arising from, or associated with, traumatic injuries. In these cases surgeons recognize two principal sources of contamination of the blood, viz., the wound itself and the vitiated condition of the atmosphere surrounding the patient: contamination in the first place directly from the wound through the blood-vessels; and in the second, by the passage of disease-germs, or the poisonous elements, into the blood along the respiratory tract. These germs may be generated in the wound, or be received into it from the surrounding atmosphere. The character of the wound and the conditions surrounding the patient thus become important subjects for the consideration of the surgeon. It has been observed, and is now generally admitted, that those wounds complicated with a fracture of the long bones of the extremities, opening large medullary cavities and extensive lacerations of the soft parts, always increase the danger of blood-poisoning. This

¹ “Archiv der Heilkunde,” erst. Jahrg., erst. Heft, S. 4.

² Ibid., S. 43.

fact may be more thoroughly understood by a brief consideration of the condition of the parts.

Frequently, in open fractures, large quantities of pus constantly remain in contact with the surface of the wound, detached fragments of bone, which become speedily necrosed, moving about with every motion of the injured limb, lacerating more or less the surrounding tissues, and thus exciting inflammation and suppuration. The periosteum becomes inflamed, a wide-spread *suppurative periostitis* is the result; necrosis of the bone, from insufficient nutrition, follows, while mechanical pressure on the pus aids in its absorption. The medulla frequently takes on this suppurative inflammation, and here the surgeon fails to receive a prompt warning of danger; slowly the suppuration progresses, without pain or other symptoms, unless the disease has extended to the other tissues; the medullary cavity, at the fractured end of the bone, may be completely or partially occluded by a new osseous formation; in such cases the absorption of pus by the comparatively large venous vessels of this cavity is greatly facilitated. The soft parts also may be the seat of dangerous trouble. The same force that produced the wound and fracture may have also contused the soft parts, destroying in a greater or less degree their nutrition, thus giving rise to gangrenous sloughs, or in other cases to the formation of abscesses, etc. I will also call attention to the fact that the laudable pus in these cases is most favorably situated for a rapid change into that commonly called ichorous. The heat of the parts and the contact of the pus with the atmosphere will not fail to effect its rapid decomposition. The question may be with propriety asked here, "Is fatal pyæmia, independent of a wound, produced by breathing vitiated air?" The answer to this question must generally be a negative, although it is certainly true that poisoning of the blood does take place to a certain degree, as is abundantly shown by the different symptoms arising in patients thus exposed who are not suffering with wounds. It is said that dogs exposed in this way are found to rapidly emaciate, and suffer from severe and constant diarrhœa. The various symptoms arising in patients confined in the overcrowded and pus-infected wards,

among which might be mentioned loss of appetite, with diarrhœa and emaciation, are too well known to require an enumeration here. Therefore it appears highly probable that living in and breathing a vitiated atmosphere may act as a strongly *predisposing cause*, only requiring a slight scratch or abrasion of the skin, in which the infection may be said to act as an exciting cause, to produce pyæmia. In reference to such complications the following questions are asked by Prof. Roser: "Is it a specific deleterious material, a miasmatic or contagious disease-poison, or, as it is generally expressed, a zymotic agent? Must we regard each particular typhus-like fever, with its remarkable changes of the blood, with its various localizations in all the organs and membranes, with its chill, furred tongue, petechiæ, delirium, etc., as we regard typhus, scarlatina, variola, etc.? or, as Virchow teaches us, is this pyæmia, so greatly feared by all surgeons, only an ontological idea? Is the word pyæmia only a general name for three different conditions, viz., leucocythæmia, thrombosis and embolism, or ichorrhæmia and septicæmia? or are there, as many have supposed, two ways in which pyæmia may originate? Is there one primary miasmatic pyæmia analogous to the other epidemic, so-called zymotic diseases? and again, a secondary pyæmia arising from suppurative inflammation wherein the poison is formed in the patient's own body which is infected by a single organ?"¹ That this disease is caused by a *specific deleterious material*, in the large majority of cases, is no longer a question for discussion. The only question to consider is, whether it always arises from this cause. We must necessarily admit that spontaneous cases do occur, especially if we include in our classification of pyæmia puerperal fever and erysipelas. Are there really any cases of sporadic origin, or are they always due to endemic or contagious influences? No definite answer can be given to these questions, although undeniably the weight of argument is opposed to a sporadic origin. The true miasmatic, as used by Prof. Roser, probably refers to the vitiated condition of the atmosphere, as seen in the overcrowded surgical and ob-

¹ "Archiv der Heilkunde," erst. Jahrg., erst. Heft, S. 39.

stetrical wards of hospitals. In no other sense can the word be appropriately used in connection with the subject of pyæmia. It is true that pyæmic diseases are found to prevail at certain seasons and in certain localities much more extensively than under other circumstances. The same, however, is true of cholera, typhus fever, scarlatina, variola, and other contagious diseases. That pyæmia is contagious has been frequently demonstrated. I therefore conclude that the prevalence and spread of this disease must be explained by the same rules as are applied to the existence and propagation of these allied affections.

2. *Septicæmia*.—The etiology of septicæmia primarily involves two essential facts, viz.: (a) the development of putrid poison, and (b) its reception into the blood. That the origin of this disease may be more easily understood, it may be advantageous to examine the circumstances under which it too frequently occurs. Take, for example, a patient who has received a compound comminuted fracture of the leg, necessitating amputation of the thigh. The amputation is performed a few hours after the injury; the flaps are closed, after which some oozing takes place which is mechanically retained within the flap, where the warmth of the parts and the presence of the atmosphere are favorable conditions for a rapid decomposition of this effused blood. Here we have a very rapid formation of the putrid poison, and further examination shows a condition highly favorable to its speedy absorption. It is a fact recognized by all surgeons that opening the medullary cavities of long bones is an invitation to putrid poison to enter the circulation; but here we find not only an invitation, but compulsion, in the form of pressure. The flaps are nicely approximated, this approximation aided by sutures and straps of adhesive plaster—conditions facilitating the agglutination of the lips of the wound which speedily follows. Other conditions which undoubtedly act as predisposing causes are, a fresh wound and the lowered vitality of the patients due to loss of blood, shock, etc. In reference to the former condition, C. Busch has shown by experiments on animals that a rapid absorption of colored oil, which as a test he injected into the medullary cavities, took place in the

lymph and blood-vessels.¹ Cases answering the above description are still occasionally seen, and, should septicæmia fail to develop within forty-eight hours, it certainly could not be attributed to good surgery. Probably it is very rarely the case that all, or even a majority of the conditions detailed above, are present, but they exist in a modified form; for instance, they frequently occur in cases of compound fracture of the long bones, with or without contusion of the soft parts, with or without extravasation into the cellular tissue, during an effort to save the limb. This putrid poison, the existence of which in the blood is a *conditio sine quâ non* for the production of septicæmia, is supposed to act as a ferment in the blood, so deteriorating it that it cannot perform its physiological functions. The disease may be induced in animals at any time by the injection of putrid animal or vegetable substances, and Hemmer declares in regard to the intensity of its action that it can only be compared with woorara and the poisonous bites of snakes. Further, other experimenters have shown that the intensity of action principally depends on the quantity of poison introduced into the circulation; hence injections made into the connective tissue are less fatal than those directly into the veins. Granulating wounds may be with impunity covered with putrid substances so long as the granulations are not destroyed.

Healthy integument and mucous membranes resist the absorption of putrid materials, while, on the contrary, fresh wounds permit absorption to take place readily, and it may be greatly facilitated by pressure. The question has been frequently discussed, in relation to pyæmia and septicæmia, whether molecular bodies ever sufficiently enter the circulation through healthy tissues to act as ferments in the blood. Billroth says: "That deleterious, infectious matters may also enter the body otherwise than through wounds, especially through the lungs, cannot be doubted; we explain to ourselves thereby, in fact, the origin of all infectious diseases, that substances find their way into the organism which act as organic poisons upon the blood and upon the whole organism;

¹ Pitha und Billroth, "Handbuch der Chirurgie," 1. B., 2. A., 1. II., 1. L., 28 S.

but whether these disease-elements which cause the infectious diseases occurring chiefly in the wounded enter the organism otherwise than through the wound is a question the answer to which must depend very much upon the particular interpretation of the cases observed.”¹ That septicæmia may arise from an ulcer, covered by necrotic tissue, in the alimentary canal, or from a similar condition in the respiratory tract, is undoubted. The fact that many questions pertaining equally to the etiology of septicæmia have already been discussed under the etiology of pyæmia, has caused their omission here.

V. SYMPTOMS. 1. *Pyæmia*.—The symptoms which pyæmia in its various forms give rise to are numerous and not easily described. Therefore it is necessary that the surgeon keep the fact constantly in mind, that this disease depends on *suppuration, cannot exist without it*, although it does not follow that in every case of suppuration there will be pyæmia; but it does follow that in every case of pyæmia there must be a vitiated condition of the blood, due to pus or its elements. Taking the natural order in which the symptoms occur, I shall begin with the chill which commonly announces the commencement of a new era in surgical cases—one of extreme danger to the patient, and the occasion of great anxiety on the part of the surgeon. The importance that will naturally be attached to this phenomenon must, to a certain degree, depend on the circumstances attending its occurrence, and therefore the following question will present itself: “Is the chill associated with suppuration?” A negative answer to this question, based on the fact that insufficient time has elapsed since the occurrence of the injury to render suppuration possible, can never fail to be a source of satisfaction to the surgeon whose experience has taught him to dread pyæmia.

Prof. Billroth has observed, in 83 cases of true multiple pyæmia, that 62 commenced with a chill, and 21 without; in 81 cases of septicæmia and simple pyæmia, 24 commenced with a chill and 57 without. The number of chills in each individual patient occurred according to the following table:

¹ Billroth's "Surgery," vol. i., p. 218. "New Sydenham Society Translations," vol. lxxiii.

| | | | | | | | | | | | | |
|---------------------|----|----|----|----|---|---|---|---|---|----|----|----|
| Number of patients, | 19 | 21 | 14 | 15 | 9 | 5 | 2 | 3 | 4 | 1 | 1 | 1 |
| Number of chills, | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 13 | 14 |

In one patient, during three weeks sixteen chills were observed, and sex appeared to have no influence on the number; but probably the longer the duration of the disease the greater is the number of chills. Still there are chronic cases with a single chill, and acute cases with many. It rarely occurs that a patient has more than one chill in twenty-four hours. Billroth noticed among his patients only 16 who each had two chills, and only six who each had three chills, in one day. The experience that fewer chills occur during the evening and night than in the morning and afternoon has been confirmed by statistics. Among 287 chills, 220 occurred from 8 A. M. to 8 P. M., while during the night, from 8 P. M. to 8 A. M., only 67 were observed. By this striking division of the twenty-four hours, Billroth desired to take into consideration the daily exacerbation, the usual daily irritation of the wound, the bandaging, and other manipulations. He saw, for example, a chill occur three times from the introduction of a sound, and twenty times after opening an abscess. The time which elapsed from first injury to first chill is seen by the following table:

| | | | | | | | | |
|---------------------------|----|----|----|---|---|---|---|---|
| First chill began, times, | 14 | 19 | 15 | 9 | 4 | 3 | 2 | 4 |
| In the week, | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

Patients who had fever before the operation were more inclined to early chills than freshly-injured healthy individuals. Billroth's experience was to have only the first chill before the end of the first week.¹ It may be further stated that nervous, irritable patients suffer much more frequently from chills than those of a phlegmatic temperament. This fact has given rise to the opinion that the absorption of pus acts especially on the central nervous system. The chills in pyæmia are supposed by Billroth to be associated with inflammation, and he says: "It must be mentioned, as a matter of observation, that chills occur almost exclusively in the commencement of acute inflammations, and are intermittent only in intermittent fever and reabsorption of pus, while they do not occur in acute septicæ-

¹ Pitha und Billroth, "Handbuch der Chirurgie," 1. B., 2. A., 1. H., 1 L., 97 und 98 S.

mia."¹ But the fever in pyæmia rarely entirely intermits; it is generally lower, however, in the morning than in the afternoon. This symptom is even more important than the rigors in enabling the surgeon to make a correct diagnosis. The use of the thermometer enables us to determine, at will, the presence or absence of fever, and there is no disease in which it should be more frequently used than in the one now under consideration. Let it, however, be remembered that the temperature frequently becomes very high within a few hours after the receipt of an injury, or the performance of a surgical operation; that this high temperature is due to septic absorption and the diseased condition we designate septicæmia. Another condition, less marked, with an elevated but somewhat lower temperature, is usually spoken of as traumatic fever. In both the conditions already mentioned the fever may gradually increase for a few days, or possibly only hours, and then slowly disappear. The patient, on or before the tenth day, in favorable cases, will be found to be free from fever. It will now be observed that sufficient time has elapsed for the formation of pus, and the patient may, with or without a chill, be again attacked with fever. This fever, if moderate, may be designated as secondary fever, and, if more marked in its character, as pyæmia. Again, in cases of severe, acute septicæmia, the patient may die before the lapse of sufficient time for the formation of pus, or, as occasionally happens, before the disappearance of fever. Associated with the septicæmia, the system becomes contaminated still further by the absorption of pus, thus producing a condition appropriately called septo-pyæmia. One important peculiarity of the temperature in pyæmia is the sudden and great changes; thus, at one hour the temperature may be but slightly raised above the normal, and at the next the thermometer may mark 105° Fahr. These sudden changes of temperature, in this disease, are of frequent occurrence, are not observed in other diseases, and therefore supply a very important diagnostic indication. It is impossible to know, or even to anticipate with any degree of certainty, when the highest temperature will exist; consequently, Prof. Billroth and other writers have suggested the desirabil-

¹ "Surgical Pathology," p. 344.

ity of having a thermometer constantly kept in a position to indicate every change in the heat of the body, and a careful attendant to note the same; but, thus far, I am not aware that it has been attempted, probably on account of the inconvenience it would entail on the patient, and the additional labor in nursing. It has been further observed that, during the existence of a chill, the temperature continues to steadily increase, and the highest seen during the whole course of the disease is attained during the hot stage which immediately follows the rigors. "This condition is followed by profuse, cold perspirations. The perspirations which accompany this disease are most profuse, like those of advanced phthisis. They never precede the rigors, but may occur independently of them. They either are continuous in their duration, or exhibit more or less distinct exacerbations. They are occasionally accompanied by sudamina and they do not abate with the use of any known remedy. . . . Occasionally perspiration is scanty; but, before death, a cold, clammy sweat and a 'tawny' discoloration of the skin occur."¹

Besides the sudamina, there are frequently observed on the skin vesicles, pustules, and boils, purpuric patches, and various discolorations. There is frequently observed to arise in the neighborhood of the wounds a reddish, erythematous blush, which soon extends to the whole limb, and commonly begins to disappear in the early part of the second week. This recently occurred in a patient under my care, and was speedily followed by an abscess of the knee-joint. The wound was situated at the hip-joint: at this point—on the lips of the wound—the first change in the color of the integument took place. It extended rapidly downward until it covered the foot, and even the toes; but the extension upward was slight, not much above the nates, on which there was situated at the time a bed-sore. It observed the same order in passing off as in coming on, viz., where it first made its appearance it first disappeared. The superficial veins leading from the wound were inflamed and cord-like. This condition of the integument and the abscess of the knee-joint were followed by diarrhœa, on which medicines had no beneficial effect.

¹ Braidwood on "Pyæmia," p. 112.

Diarrhœa continued, with occasional vomiting, until the death of the patient. The pulse in pyæmia is variable—often nearly normal as regards frequency, and at other times very frequent. It has been remarked, in some cases, that the pulse seldom rose above 90 per minute, until near the fatal end. The pulse, although only moderately accelerated at the commencement of the disease, always becomes more rapid, frequent, feeble and irregular, toward the termination of the unfavorable cases; while in cases of recovery it returns gradually to the normal standard. In all cases in which the blood has been examined during the progress of pyæmia, the examiners have agreed in regard to the extreme coagulability, diminution of the number of red corpuscles, and the increase of granular spherical bodies. The red corpuscles, even in the earlier stages of the disease, show evident indication of disintegrating; but, as the disease progresses, the microscopical examination steadily confirms, with increasing proofs from day to day, that the first idea was correct. There is a steady diminution in the number of red corpuscles, a steady increase in the number of pus- or possibly white blood-corpuscles. Epistaxis occasionally occurs, and also venous oozing from the wound. The condition of the tongue in pyæmia may be regarded as an important symptom, indicating the state of the alimentary canal; not, however, during the prodromal stage, but after the disease has progressed a few days. It is then observed that the tongue has become peculiarly smooth, dry, and frequently excessively red. This smoothness is caused by the collapse of the papillæ, and the dryness by a diminished secretion.

The organ now frequently appears as though covered with a thin layer of collodion, which had been caused to dry on the surface, presenting something of a glazed look. Again, the tongue may be covered with brown crusts, and the teeth with sordes. These brown crusts and sordes are usually seen in advanced cases, following the first condition described. Much importance is attached to these brown crusts by many experienced surgeons, and although there may be very marked improvement in all other symptoms, still they insist on a very guarded prognosis until the tongue has assumed a healthy

appearance. Aphthæ on various parts of the mouth and pharynx are frequently present in chronic cases and absent in acute cases. Herpes of the lips sometimes occurs in the commencement of the disease; vomiting is comparatively rare; but there is, even in the early stages, a complete failure of the appetite, with great thirst. Singultus is rarely present, possibly never in genuine pyæmia, but frequently in septicæmia, and occasionally in septo-pyæmia. Diarrhœa is not so frequent, or the stools so copious, in pyæmia as in septicæmia. Billroth observed, in one hundred and eighty cases of pyæmia, thirty-two cases of diarrhœa. It is impossible to determine whether these cases in which the diarrhœa occurred were pure or mixed pyæmia. The stools are generally of a pappy consistence, and often passed involuntarily in bed. There are, however, severe cases of pyæmia with a high fever, accompanied by obstinate constipation, which requires the administration of cathartics. Examination of the heart may, in rare, exceptional cases, show the existence of pericarditis, although usually the only indications of disease are the too feeble sounds. Auscultation and percussion over the lungs, even in cases of diffuse metastatic abscesses, are frequently unsatisfactory, for the same reasons as in miliary tuberculosis. The large deposits in the lungs are by these means readily determined. There may be a sensation of suffocation, the pneumonic sputa, the friction-sounds of pleurisy or pleuritic effusion; and the existence of these symptoms would materially aid in the diagnosis of metastatic abscesses. Enlargement of liver and spleen may be determined before death, and in connection with other symptoms would aid in diagnosing deposits in these organs. The urine in the first stage of the disease is scanty, high-colored, contains a large amount of salts, and is of a high specific gravity. Epithelial, fibrinous, and blood casts, and albumen, are also occasionally found in it during the course of the disease. Billroth mentions a case in which there was complete suppression, with uræmia. In many cases of pyæmia, suppuration of the joints, one after another, takes place with great rapidity and with comparatively little pain; but occasionally some swelling, redness, etc., are present. In most cases these suppurations are easily diagnosed. Instead

of the suppuration taking place in the joints, there are cases in which it occurs in the cellular tissue ; and I have recently seen a case where abscess after abscess formed with such rapidity that within a single week the patient was literally covered with abscesses, from the crown of his head to the soles of his feet. Delirium generally exists during some stage of the disease, more frequently the last ; is then mild in its character, although active delirium has been observed in the first stage. Patients are low-spirited, and very apprehensive of death. The face at the beginning of the attack may be flushed or pallid, and toward the end becomes careworn. The breath sometimes has a "sweetish" or "purulent" odor. The patient rapidly emaciates. The changes in the wound are in some cases very marked, even in the first stage of the disease. The suppuration, which has been previously free and healthy, may suddenly be checked, the wound becoming dry. The discharge, if it continues, becomes scanty, thin, ichorous, or greenish. The granulations, if previously healthy, soon slough. These changes may not always appear in the first stage, but, should they not then take place, they may be expected later in the disease.

Summary of the Symptoms.—Suppose that a patient, suffering with a compound fracture of the leg, has been admitted to a ward in a hospital in which this disease is prevailing. The surgeon is determined to save the limb, if possible. The dressings are carefully applied, the wound frequently cleansed, and the patient appears to be doing well, until the twelfth day, when he is suddenly seized with a chill, which is followed by a high fever and profuse sweating. The countenance shows anxiety ; the patient is evidently depressed ; the face flushed ; the conjunctivæ congested ; the pulse frequent ; he complains of great thirst ; and his breath has a sweetish odor. Several days have elapsed—the temperature of the body has been taken very frequently, and always found above the normal. There is now observed a dusky and icteric discoloration of the skin ; tongue peculiarly smooth, red, and glossy ; disinclination to take food ; frequently bronchial, pleuritic, or pneumonic symptoms now make their appearance, or the patient may complain of pain in some joint, which an examination will show to be

slightly tender to the touch, œdematous, and the integument over it slightly reddened; abscesses quickly form. The wound assumes an unhealthy appearance. The discharge from it either ceases, or is changed in character. Granulations, slough, and abscesses, now form in the cellular tissue with great rapidity. Diarrhœa may make its appearance; if so, the stools are passed involuntarily. The patient loses strength, and rapidly emaciates. At this stage of the disease he remains in an unconscious condition, and death soon closes the scene.

2. *Septicæmia*.—The symptoms of septicæmia may be sketched as follows: A patient is admitted to the hospital with a severe injury of the leg, requiring an amputation of the thigh. The amputation is performed, and the flaps are closed. The surgeon visits the patient twenty-four hours after the operation, and finds the pulse frequent; tongue, lips, and throat dry; skin hot, and the temperature of the body high. The patient replies accurately to questions, but with some hesitation. He is much inclined to sleep; has entirely failed to take nourishment; drinks frequently when aroused from his lethargic condition; and has vomited everything taken into his stomach since the operation. The dressings are now removed from the stump, when the foul odor of putrefaction greets the attendants. It is observed that there is considerable discoloration of the flaps, the edges of which are blackened. Above these blackened edges the integument is reddened, and slightly œdematous. The sutures are cut, and there escapes a few drachms—possibly ounces—of highly-offensive, odorous fluid, the decomposed remains of blood, etc. Further examination of the flaps on their inner surface shows that their capillary circulation has ceased. The tissues, instead of presenting a life-like appearance, are now of a very dark brown color and occasionally mottled with dull grayish spots, although the movements of the ligature at the point where it embraces the femoral artery show that the blood still rushes against the artificial boundary. Let us now leave our patient, without further comment, for the next forty-eight hours, when we will resume the examination. We now find the same dryness of the mouth that was previously noticed; the pulse is more frequent, and has become very feeble; he complains of

much thirst; has vomited frequently; taken but very little nourishment, and that only at the urgent solicitation of the attendants. The temperature of the body is higher than at the former examination; has been steadily increasing; in the morning it is lower, however, than in the evening of the same day. The patient is lethargic; is suffering with a profuse diarrhœa. The odor of the stools is highly offensive: they are properly described as rice-water evacuations. Abdomen tympanitic, body bathed in perspiration; respiration rapid; slight bronchial symptoms; urine scanty, high-colored, and contains albumen. The examination of the stump shows that gangrene has extended rapidly, involving not only the flaps but a portion of the adjacent tissues. The stench arising from the wound is almost stifling. The decomposing fluids are continuously dropping. That portion of the thigh not already gangrenous is now very œdematous; the integument covering it is much discolored, being of a dark, icteric, or reddened hue. We now allow twenty-four hours to elapse, and then make our final examination. The patient's tongue more moist, body still bathed in perspiration; eyes dull; conjunctivæ icteric, and the same hue extends to the body, though in a less marked degree; pulse very frequent, feeble, and not easily counted; temperature below normal. Singultus is now present, and has been, during the last twenty-four hours, very troublesome. Bronchial symptoms, combined with marked symptoms of œdema of the right lung; diarrhœa the same; gangrene still extending.

It must be admitted that the report here offered shows only the symptoms that are found in a single class of cases. These symptoms vary much in different cases, and the variations are especially marked in the acute sepsis maintained by *Maisonneuve*, under the head of "*Gangrene Foudroyante*." In these cases there appears, immediately after the receipt of an injury, enormous œdema about the wound, which extends rapidly in every possible direction, followed by the death of the patient within a few hours, unless prompt measures are adopted. The puncture of the cellular tissue, or of the blood-vessels involved in the œdema prior to the death of the patient, gives rise to the escape of a highly-

offensive gas. Roser mentions a case of this disease in which he promptly amputated the limb of the patient through the healthy parts without even waiting for the administration of an anæsthetic, and the patient recovered. The symptoms of septicæmia must, necessarily, greatly depend on the condition of the patient and the amount of septic material introduced. But it is not deemed necessary to dwell longer on this subject. The intelligent surgeon has little difficulty in making the differential diagnosis in pyæmia, septicæmia, and septo-pyæmia. The chill at the commencement of pyæmia may possibly be mistaken for the chill of intermittent fever; but the proper use of the thermometer cannot fail to correct this error. It will be remembered that in cases of intermittent fever there is, usually, a distinct intermission; but in pyæmia the fever is constant, with a tendency to exacerbations. Again, the chills of intermittent fever occur usually at regular intervals, while in pyæmia they are irregular.

VI. TREATMENT. 1. *Pyæmia*.—The treatment of pyæmia and septicæmia necessarily opens the whole question of surgery as it pertains to the management of wounds. The prevention of these diseases is of primary importance, and he who desires to save the greatest number of lives possible is, therefore, compelled to use all available means for the accomplishment of this object. The knowledge that the profession now possesses in regard to variola and its management teaches us an important lesson. The prevention of both pyæmia and septicæmia is probably within the scope of possibility in the large majority of cases; but the cure of the affection when fully developed is always doubtful and frequently impossible. Every surgeon will readily admit that, were it possible to secure union by first intention in all cases of wounds, then it would be impossible for either septicæmia or pyæmia to occur in surgical practice. Therefore it follows that the character of the wound, the method of operation, the surroundings of the patient, and the character of the treatment, thus become proper points to consider in this division of the subject. The character of the wound and its relations to pyæmia and septicæmia have already been briefly referred to under the etiology of these diseases. The various methods of oper-

ating, their respective advantages and disadvantages, require more consideration than space will admit of here. The surroundings of the patient is a subject of vast importance in a prophylactic view, and should never be lost sight of in the construction of hospitals. I desire here to express my firm conviction that surgical pyæmia is *essentially* and almost *wholly* a hospital-disease. It is true there are some eminent surgical authorities who deny its contagiousness, but this denial seems to me a mere quibble—opposed to the etiology and history of the disease. The question of surroundings for the patient presents to my mind the following demands as *sine quæ non* for obtaining the best possible results in surgery : (1.) Absolute cleanliness. This demand should be strictly enforced in regard to the wound, the patient's body, the bedding, and everything else, including nurses and instruments. (2.) Absolute purity of the atmosphere. (3.) Moderate and equable temperature, containing a proper amount of moisture. (4.) Proper quantity of nutritious and easily-digestible food, with suitable drinks, etc. (5.) Cheerful and pleasant surroundings, especially in companions, nurses, and other attendants. It may be objected to these conditions that they can never be obtained. I must confess that perfection in every detail cannot always be attained, but I am thoroughly convinced that he who makes a determined effort in this direction will succeed far better than that person who is constantly looking about for some excuse for his negligence. The overcrowding of surgical wards with severe surgical cases, especially where the ventilation is defective, is only one step removed from homicide. I remember a small ward, crowded with the worst surgical cases which could be conveniently collected, in which there was less than six hundred cubic feet of air to each patient, and this in mid-winter, with no other means of ventilation than that furnished by lowering or raising the windows; the odor of pus constantly pervaded this ward in spite of fruitless attempts made every day to purify it; the windows were frequently lowered by the attendants, but very quickly closed by some of the patients. The result was here, as had been anticipated, an outbreak of pyæmia, which carried off three of the nine patients. There should be

allowed to each surgical patient, while there is considerable suppuration still going on, two thousand cubic feet of air, and more if possible. The ventilation should be so arranged that neither the patient nor the nurse can change it. The ventilation ought to be wholly under the control of the attending surgeon. There are very few surgeons who give to these important matters the time and consideration that they should receive, and few who accomplish here as much as they might. The question of treatment brings up the entire subject of antiseptics. The favorite remedies of this class are carbolic and salicylic acids, permanganate of potash, chloride of zinc, and liquor sodæ chlorinatæ. There is no doubt that good results may be obtained with any of these remedies. Much more will depend on the manner in which they are used than on the remedy itself. The surgeon should never forget that he uses medicines merely as agents to enable him to accomplish certain objects, and, keeping these in mind, he need very seldom fail with his antiseptic when the object is to prevent putrefaction in an open wound. He should at all times, by the proper use of the senses of sight and smell, be able to decide promptly whether or not the antiseptic is accomplishing the work. In certain cases, while using certain antiseptics, it will be found advantageous to keep up constant irrigation; and in other cases, by certain methods of treatment, the antiseptic is stored up for gradual use, as may be required.

Therefore, it appears certain that each method of treatment may possess special advantages in particular cases, and probably the same may be said of the antiseptic itself. The importance of this subject may be more fully appreciated when it is remembered that it is generally admitted by the best surgical authorities that more lives are lost from septic infection than from all other causes combined during a war. The further consideration of this subject may be arranged for convenience under the heads of local and general treatment. The local treatment of the wound should, if possible, be of such a character as to prevent the absorption of either putrid substances or pus. It, therefore, becomes highly important, in cases of amputations and other operations, that all tissues

injured to such a degree as to be likely to excite either putrefaction, irritation, or inflammation, should be removed. The same care is necessary in removing all foreign bodies from the wounds in cases where no operation is performed. The amputation of the injured limb may be necessary to prevent the development of these diseases, or may be resorted to in certain rare cases after the origin of pyæmic symptoms; however, in the latter instance great care should be taken to remove all the tissues already infiltrated with serum, otherwise nothing will be gained. The use of the surgeon's knife at the proper time may be the best prophylactic measure against both pyæmia and septicæmia, but this measure should be directed by an intelligent mind, and the instrument guided by a practised hand. Again, it is found that opening a large medullary cavity is attended with danger to the patient. This fact teaches an obvious lesson. The wound existing, or the operation having been performed, the surgeon now turns his attention to the prevention of putrefaction and inflammation. The first source of danger requiring attention from the surgeon is the fluid escaping from the wounded surface. Do not allow it to undergo putrefaction in contact with the wound. Whether or not there is danger to be apprehended from inflammation, depends largely on the character of the wound: contuso-lacerated wounds are especially liable to become inflamed, and many other varieties, only in a less degree. The use of sutures is a question to be decided in each particular case. The same may be said of the use of antiphlogistic remedies. The question having been decided in favor of their use, then comes the selection of the special remedy. Prof. Billroth has recently given this subject much thought, and thus records his opinion: he inclines to the belief that the bath may be properly used in the treatment of contuso-lacerated wounds confined strictly to the hands and feet. Here the patient finds comfort when the temperature of the bath is properly regulated and the limb allowed to float in the water. In the majority of cases he prefers the use of ice either with or without the ice-bags. He found that the application of ice to a limb lowered the general temperature of the body, diminished the size of the capillaries in the diseased parts, and re-

tarded putrefaction, also lessening the absorption of putrid substances and limiting the extension of inflammation. He also claims that wounds heal kindly even during the continuation of the treatment. There are cases in which the use of leeches may be advantageously resorted to for the purpose of relieving inflammation. Warm poultices may be used for the purpose of effecting a more speedy removal of the necrotic tissues covering the surface of the wound than would otherwise take place, but it should never be forgotten that the "poultice is a means of applying continuous heat with moisture, and of softening the tissues. An afflux of blood takes place to the parts, the vessels dilate, the tissues, softened by the combined influence of heat and moisture, permit the easy diffusion of fluids. . . . Foul-smelling wounds requiring the use of poultices are best treated with the yeast or charcoal poultice. . . . The application of poultices sometimes degenerates into abuse. If too long continued the skin becomes white, wrinkled, and sodden, small abscesses or boils form, and the vessels of the parts very slowly regain their tone. If kept too long in contact with wounds or ulcerated surfaces, the granulations become pale and flabby, and the healing process is retarded. Applied indiscreetly to inflamed joints, they may promote suppuration, and thus permanently injure these structures. If kept long in contact with a large extent of surface, they will lower the general tone and vigor of the system, depress the systemic circulation, exhaust the irritability of the vaso-motor nerves, and thus seriously embarrass the reparative process, if not wholly prevent repair."¹

It appears probable that more injury than good results from the use of poultices in cases where there is reason to fear pyæmia. I think, in all such cases, the use of the poultice should be limited to the cleansing of the wound by hastening the removal of necrotic tissues, and am satisfied that the practice of wrapping the whole arm or leg in hot poultices, in cases of cellulitis arising in connection with septic absorption, is highly *injurious, especially when continued for a long time*. Free scarification of the integument where there is great tension of the parts may possibly become necessary for the pur-

¹ Bartholow, "Materia Medica and Therapeutics," pp. 515, 516.

pose of relieving pain and aiding the circulation; but the surgeon should not forget here that he is opening new avenues for the admission of the poison. Abscesses should be opened as soon as discovered, in the majority of cases, because of the pain and fever caused by them. Tincture of iodine is serviceable, in certain stages of inflammation, as a local application. Caustics may be used to aid Nature in throwing off a slough, and occasionally as a stimulant to an indolent wound which fails to granulate properly. Healthy granulations should never be destroyed lest their destruction should open other channels for the admission of the septic poison in the system. Drain-tubes may be required to prevent any accumulation of pus within the wound. It has been suggested as a prophylactic measure against pyæmia that a ligature of the veins between the thrombus and the heart would be a rational measure. It seems to present an almost insurmountable obstacle in the determination of the venous branch which should be ligated, and the impracticability of ligating the principal venous trunk of the limb. However, it is said that Lee has successfully ligated the cephalic vein at the elbow, in two cases of injury of the hand, after the appearance of the pyæmic chill. It has also been suggested that transfusion of healthy blood ought to be tried in suitable cases of this affection. In the general treatment of pyæmia there has been recommended at various times a great variety of drugs; but the general want of success attending their use leaves comparatively few to be mentioned here. The mineral acids are still employed, and are found, at least, agreeable drinks, and as such can still be recommended. The sulphites of magnesia, soda, potassa, and lime, are recommended by Giovanni Polli for the treatment of typhus fever, scarlet fever, small-pox, septicæmia, and pyæmia. He further suggests that the medicine should be given until the whole quantity taken bears to the weight of the patient's body the proportion of one to a thousand. The experiments made on animals with these salts seem to confirm their value in the treatment of septic disease. It is certainly true that animals treated with these salts are not so easily affected by septic poison as those which have not received the treatment. Further, it has been shown that

putrid substances when mixed with either the permanganate of potassa or the carbolate of soda, and then injected, are harmless, although the same quantity of putrid matter without the salts destroys life. Quinine certainly, in most cases of pyæmia, is a valuable agent. In large doses it enables the surgeon to reduce the temperature of the patient, and in smaller doses it frequently serves a valuable purpose as a tonic. It has also undoubtedly considerable value as an antiseptic. Labbin has recommended the use of large doses of ergotine in infectious fevers, which should begin on the day the injury is received. The use of drastic cathartics should be avoided, and also sudorifics, on account of their prostrating effects. In some cases hypnotics may be required to secure sleep. Tonics are always more or less useful. The free use of stimulants is also indicated. Brandy, wine, and whiskey, may be used by the patient in accordance with his own taste. Musk, ammonia, and camphor, are occasionally required. However, it should not be forgotten that, in cases where the disease has become fully developed, the usual termination is death, few recoveries being recorded. In the early stages of this affection, by the removal of the patient from an overcrowded hospital-ward to some place where pure air, proper hygienic arrangements, and a judicious use of medicines, can be obtained, recovery may take place; but under other circumstances the prognosis is exceedingly grave.

2. *Septicæmia*.—The treatment of septicæmia in most particulars is the same as that of pyæmia. The first effect should be to prevent the development of the disease, and the second to cure the patient in cases where the affection has already developed. It is not in our power to limit or in any way regulate the primary injury, but we are obliged to take the patient as he is. The amount of destruction to living tissues may be great or small. The question of an operation, the character of the same, and the subsequent management, must be determined in accordance with the circumstances of each particular case. The primary death of the parts is generally due chiefly to the injury itself; the secondary, frequently to bad surgical management. Let us take a case in which the primary injury has been severe, greatly diminishing but not

destroying the circulation in the injured parts: here the immediate application of ice would be locally injurious, but an evaporating lotion or warm applications might assist Nature. We have already seen, while speaking of the treatment of pyæmia, that the continuance, for a long time, of hot applications, is frequently injurious, or *even pernicious*. Let us now call to mind a case of contusion situated in the neighborhood of a large joint, where the injury to the soft parts will probably be followed by much sloughing if ice is used; but the great danger is inflammation of the synovial membrane, and, to avoid this danger, the surgeon requires perfect rest of the parts, the application of leeches, and finally cold, or even ice. It is humiliating to the profession that we are obliged, even at this date, to admit that the treatment of septicæmia is largely symptomatic. The profuse choleraic diarrhœa which generally accompanies this disease may be regarded as an effort of Nature to eliminate the septic poison; but, nevertheless, it is so prostrating in its effects on the patient, that it requires to be controlled with properly-selected astringents, and these remedies may be still further aided by the use of tonics and stimulants. The treatment of septicæmia may be summarized as follows: (1.) A strict adherence to the five rules given under the head of prophylactic treatment. (2.) The avoidance of all putrefaction in contact with the wound, especially prior to the development of sufficient granulations to completely cover its surface. This object is to be accomplished by the removal of all necrotic tissues, the avoidance of putrescent fluids by cleanliness, and the proper use of anti-septic agents. (3.) Free use of the alkaline sulphites and hyposulphites. These drugs should be used, in all cases where there is reason to anticipate the development of septic disease, as soon after the receipt of the injury as practicable, but should not be neglected even after the development has occurred. (4.) Sulphate of quinine should be used in all cases where the temperature is above 100° Fahr., and its persistent use in large doses may be necessary to prevent its rising still higher. It will be remembered in this connection that experience has taught that "a temperature of 108½° Fahr. is the limit

beyond which life can no longer exist,"¹ and a much lower temperature is not without danger. "The essential danger of fever in acute diseases consists, then, in *the deleterious influence of a high temperature on the tissues.*"²

ART. III.—*The Principles of Cathartic Action.* By THOMAS J. MAYES, M. D., Upper Lehigh, Pa.

To arrive at any principle it is necessary first to collect all facts possible which have any bearing on the subject in hand, and then, by the process of induction or deduction, or by both, endeavor to trace an underlying element or factor which is common to all such data. It comprises the method of combining a number of occurrences or phenomena into one chain of action, and thereby giving them an intelligible relation and explanation; and it is very clear that the greater the number of phenomena which such a principle is capable of unifying, the stronger the evidence of its truthfulness. Principles worked out in such a manner, we have endeavored to produce in this paper concerning the cathartic action of medicines.

It has been one of the most early and common observations in the history of medicine, that upon the introduction of certain substances into the body an increased discharge of fecal matter followed from the intestinal canal. The decided and almost unfailing action of these substances gave them a prominent and valuable place in the treatment of many disorders, and, like venesection and blistering, they had the misfortune of being subjected to a large amount of abuse.

For a very long period it was a much-mooted question whether cathartics increased the number and frequency of the stools by hastening the peristaltic functions of the bowel only, or by inviting a more profuse and free excretion, or by acting in both ways. Various experiments have been made, and decidedly opposite conclusions have been reached. Thus, M. Thiry divided the intestinal tract in two places, closed up one

¹ Liebermeister, "New Sydenham Society Translations," vol. lxvi., p. 278.

² Ibid., p. 280.

end of the piece thus detached (when it had the appearance of a cut-off finger-end of a glove), and then sewed the other and open end to the wound in the abdomen, thus making a short pouch, with its nerves and blood-vessels remaining intact, in and by which he could directly observe the action of different substances on the intestinal mucous surface. He then, at separate intervals, introduced into this sac sulphate of magnesia, croton-oil, and senna, none of which, he found, induced any increased secretory action. Dr. S. Radziejewskie repeated Thiry's experiments, and likewise arrived at negative conclusions concerning the action of croton-oil, castor-oil, calomel, senna, and gamboge. These observations, together with those of Schiff, rendered it probable, to the minds of many, that cathartics produce their action on the bowels merely by accelerating their peristaltic movements. However, in 1870, Moreau made some interesting experiments, since confirmed by Vulpian and Brunton, which show very decidedly that cathartics, besides inducing peristaltic action, also produce a watery discharge from the bowels. The following is a description of the experiment: Three isolated chambers were made in the small intestine, by tying around it, at different places, four ligatures a few inches from each other. In the middle of these inclosed spaces the cathartic medicine was injected with an hypodermic syringe, the whole returned into the abdomen, left there for several hours, after which the animal was killed, the contents of the middle chamber measured and compared with those of the other two, and invariably, in every one of the experiments, a copious watery secretion was found in the middle chamber, while the other two were empty, or very nearly so. The substances experimented with were croton-oil, elaterium, gamboge, jalap, and sulphate of magnesia, and in every instance there was a decided serous exudation into the middle cavity, and especially so in the case of the sulphate of magnesia. This, with some other evidence of minor importance, makes it quite certain, then, that cathartic substances produce a watery exudation from the bowels at the same time that they increase peristaltic motion, and this view is also more in accordance with what one would be led to expect from a knowledge of the laws which preside over organic matter.

Having now given evidence to show that cathartics produce their action by accelerating the peristaltic movements of the intestines, and by inviting a watery discharge, we have reduced their action to two elements, which are common to them all, viz., peristaltic motion, and exudation; but, in order to elucidate our subject more fully, it devolves upon us to reduce these two factors to some principle, or principles, which is, or are, still more common to some or all organic tissue, i. e., to the laws which govern muscular motion and excretion in general. In other words, to show how this hurried peristaltic motion and increased exudation are caused by cathartics, and what the laws are which control these phenomena.

It is very evident, since muscular contraction is one of the leading features in the phenomena of peristaltic action of the bowels, that this leads us to inquire into the intimate cause and *modus operandi* of muscular motion; and, though we still hold the theory so ably advocated by Dr. C. B. Radcliffe, in his "Dynamics of Muscle and Nerve," "that muscular motion is inversely related to the supply of arterial blood to the muscles," to be partially true, especially as far as it relates to some pathological processes, yet, from all the evidence which we have been able to collect on this subject, we must candidly confess our conviction that this theory cannot serve wholly to explain the physiologic method of muscular motion.

It is acknowledged by all the leading physiologists of the present day that the power of contraction is inherent in the muscle itself, and not transmitted or given to it by the nerve, and that the nerve merely serves to control and liberate that power of contraction already residing in the muscle. Now, investigation proves that in rest the longitudinal surface of muscle is electrified positively, and the transverse surface negatively, while in action this relation of muscular electricity is reversed. If a muscle is made to contract by bringing a physical or chemical excitant in contact with the nerve which supplies it, or if it is irritated directly by these means, contraction and this reversal and discharge of electricity will follow. Now, whatever relation these two different electric states may bear to muscle in rest and in motion as to cause and effect, it remains very manifest that the constant con-

dition of rest and one electric state, and of motion and that of the other electric state, are very intimately associated, and the fact that muscle does not contract unless there is a reversal and discharge of electricity makes it exceedingly probable that those two states are dependent on each other. Given, then, a muscle in equipoise—its longitudinal surface electrified positively, and its transverse surface negatively—and a force to disturb this electric equanimity and contraction will take place. A nerve is calculated to transmit just such an impulse or shock to the muscle as will tend to disturb its electric relation in rest; for an impulse going through a nerve to a muscle is but the transmission of a force to the muscle. But, on the other hand, in justice to Dr. Radcliffe, it must be stated that the nerve is not the only medium through which the natural electricity of a muscle can be disturbed, and so be made to contract; for it is very clear, if muscular rest or elongation depends upon a full and liberal supply of electric tension, that this supply must be kept up constantly, and any cause which will seriously interfere with this process of supply will cause a state of electric exhaustion in the muscle, and so produce contraction. In the light of this view the following phases of muscular motion become very obvious: Animals, when killed by the butcher's knife, and persons who die by strangulation or hanging, expire in convulsions; tying the carotids of a rabbit, and then compressing the vertebral arteries, is followed by convulsions; *rigor mortis*, which is the most intensified form of muscular contraction, takes place in the absence of all blood, but, after a muscle has passed into *rigor mortis*, it can, a short time after death, be caused to relax by injecting fresh blood into its blood-vessels.

The latter, then, very probably, is the method by which muscular motion is produced in certain pathological conditions; but we believe that a true view of muscle and nerve will at once point out that this is not the way in which muscular contraction is brought about in the normal state. It is very obvious that neither organized muscle nor nerve is essential to display the property of contractility in its primitive state, for in the lower order of animals, as in the *Hydrozoa*,

and in certain plants, as in the *Drosera rotundifolia*, contraction takes place without the aid of muscle or nerve, on the slightest touch. But as the scale of development advances from the lower to the higher and still higher forms of life ; as the organism becomes more complex in structure and in function ; and as it becomes essential for the preservation of life to centralize, combine, and coördinate the movements of the different organs in the body—just in that proportion precisely does the need of a nervous system gradually arise. The nervous system is made up of afferent fibres which transmit impressions from without, and of ganglions which receive these impressions and reflect them or send them out to the muscles by means of the efferent or motor fibres.

Now, from observation and experiment, we know that as long as nothing comes in contact with the intestinal canal, or as long as it remains empty, it is motionless, and its mucous membrane is pale and covered with a thin coating of mucus ; but, as soon as any foreign substance is introduced into it, its pale surface becomes red and injected, and peristaltic motion and secretion follow. These phenomena are succeeded by relaxation of the muscles, with comparative paleness of the mucous membrane ; but, if still more foreign matter is presented to the bowel, it will reassume its former discoloration, and the contraction and exudation will also be repeated. Now, a substance meeting or coming in contact with the mucous membrane of the alimentary canal, naturally denotes or implies an action, either chemical or mechanical, on that surface ; and, since action and reaction are always equal, this action is followed by a reaction on the substance from the bowel. An action on any part of the body means that a certain degree of force is transmitted to its component molecules, thus setting them into greater activity. Greater activity in any part implies a greater waste or metamorphosis of force and matter, which, in turn, demands a greater supply of nutritive and oxidizing material ; hence follows, as a natural law, greater activity of the circulation : the blood being forced on by these and various other causes, crowds and distends the blood-vessels, and thus gives a reddish color to the mucous membrane. It is very evident that the nerves which supply the intestinal

tract likewise share in this irritation or disturbance in the alimentary canal, which is naturally transmitted through their respective ganglia, whence it is reflected back to and discharged through the muscular coat of the bowel, thus causing contraction or peristaltic motion. That this is most probably the true view of the *modus operandi* of cathartic medicines is well substantiated by Dr. H. C. Wood, Jr., who found that, after section of the right pneumogastric nerve (which is distributed to the intestines), in the cervical region, "the most powerful cathartics, croton-oil, calomel, podophyllin, jalap, arsenic, etc., failed to produce purgation, even in doses sufficient to cause death."

We also learn from the researches of Moreau, Vulpian, and Brunton, that cathartic medicines, besides increasing the peristaltic action of the bowels, call forth an increased exudation from the alimentary surface; and, in order to get a more complete conception of cathartic action, we must inquire into the manner by which this liquid effusion is caused.

Now, from various sources, we have evidence that the process of excretion in the body is but a phase of the universal law of diffusion of matter through matter, modified chiefly by pressure. For, from the investigations of Graham, who divided organic matter into colloids and crystalloids, we know that all the excretory products of the animal body belong to the crystalloid class, the diffusive power of which exceeds that of the colloids in an enormous degree. And a crystalloid, in diffusing through colloid matter, will have its direction greatly determined by pressure, for motion takes place along the line of least resistance. But pressure not only determines the passage of crystalloids out of the system, for it may under certain conditions also force colloid matter out of the body. Thus, for example, the kidney, which is called an hydraulic press, on having its renal vein tied, will permit the exit of albumen through its excretory membrane. So the degree of pressure, we may conclude, forms an important and leading factor in the process of excretion.

In the application of this part of our theory to the subject in hand, it is very obvious that the structure or formation of the alimentary canal is very favorably conditioned to carry

on the process of excretion, for it presents an immense surface, abundantly supplied with blood-vessels, surrounded with muscular fibres, the latter of which, when called into action, compress the circulatory apparatus from almost every direction; and thus, by exerting an extra amount of pressure, aside from that which is produced by the capillary engorgement, causes the crystalloids, and also, perhaps, some of the smaller-atomed colloids, to exude through the membrane into the intestinal tube.

There is a wide difference in the intensity of action of the various cathartic medicines, but they may all be said to act as physical irritants on the alimentary canal. Thus some of the most active and powerful cathartics, as, for example, elaterium, gamboge, croton-oil, etc., have a local irritant action on the skin; and, as the skin and mucous membrane of the alimentary canal are but differentiations of what was originally the same structure, we can, from this alone, well suspect that they have a similar action on the intestinal surface. Just as cantharides and mustard have the power to produce a temporary congestion of the skin, and even cause an exudation of fluid, so, on the same principle, do cathartic medicines act on the intestinal canal, only in a less intense degree, for the nature of the structure of the latter makes it more impressible than the former; hence a small amount of force will serve to disturb the equanimity of the bowels, while it would hardly have any appreciable effect on the skin. The exudation in both the skin and bowels is mainly governed by the same law of pressure, and the peristaltic movements, which are called forth in the operation of catharsis, are only a result of the irritation, and take place in the manner described above.

There is not only a wide difference in the intensity of the action of cathartic medicines, but some have the peculiar property of producing a copious discharge of watery fluid, without affecting to a like extent the peristaltic movements of the intestinal canal. Thus the saline cathartics have the power to deplete the mucous membrane without causing any great intestinal commotion. This is undoubtedly due, aside from their irritant action, to the special physical property which salines possess in common, for it is a well-known fact

that an animal membrane dividing a saline solution from pure water has the power to cause the water to pass through itself over on the side of the saline solution.

We have here, then, all the essential conditions in which peristaltic motion of and excretion from the bowels, as produced by cathartic medicines, can take place in accordance with the principles of muscular contraction, and with the laws of diffusion laid down above.

But the principles of catharsis would be but imperfectly wrought out were we to omit saying something about the action of cathartic medicines on the liver, for all medicines which cause catharsis of the bowels also produce greater activity in the liver. This action of cathartics might have been foreseen on anatomical and physiological grounds alone, for the liver is intimately connected with, and is evidently but a specialization of, the alimentary canal. Herbert Spencer, in his "Principles of Biology," vol. ii., page 316, says: "All these appendages of the alimentary canal (liver, pancreas, etc.), large and independent as some of them seem, really arise by differentiations from its coats. The primordial liver, as we see it in a simple animal, such as the *Cunaria*, consists of nothing more than bile-cells scattered along a tract of the intestinal surface. Accumulation of these bile-cells is accompanied by increased growth of the surface which bears them—a growth which at first takes the form of a *cul-de-sac*, having an outside that projects from the intestine into the perivisceral cavity. As the mass of bile-cells becomes greater, there arise secondary lateral cavities opening into the primary one, and through it into the intestine; until eventually these cavities, with their coating of bile-cells, become ramifying ducts distributed through the solid mass we know as a liver."

It is held by some that those agents which are capable of causing an increased secretion of the liver do so by transmitting the irritation which they generate in the alimentary canal along the common bile-duct, and thus excite the gall-bladder and the liver-cells to greater activity; but recent experiments demonstrate that an increased flow of bile takes place under the influence of cathartics after all communication between the bile-duct and the duodenum is cut off. The only availa-

ble channel through which these agents can gain access to the liver is by means of the portal circulation; and, from anatomical and physiological analogy to other excreting organs, we find reason to believe that the liver pressure and diffusion, which we found such important factors in alimentary excretion, also play a very prominent part in the secretion of biliary matter; that by means of the portal blood these agents come in direct contact with the liver-cells, irritate and incite them to greater activity, invite a larger quantity of blood, thus causing an increased pressure, which aids the low-atomed excretory matters in making their ready escape from the blood and from the liver-cells, where some of them are formed. That the liver is excited by substances which reach it through the portal vein is rendered evident from the fact that the flow of bile is most active after eating, attaining its maximum between the second and eighth hour after a meal, this period corresponding with the time when the portal vein absorbs and conveys the nutrient material from the intestines to and through the liver, and which naturally thus becomes its stage of greatest physiological activity.

Having now indicated, in a general manner, the route which cathartic medicines pursue from the alimentary canal to the liver, as well as their mode of action, it becomes very manifest that, in order to gain ready access to the latter organ from the former by this channel, they should have an uninterrupted passage; and, on inquiry, we shall learn that those medicines which cause the most intense cathartic action of the alimentary canal, and thereby generate a violent state of hyperæmia in this organ, which becomes more or less a source of obstruction, possess the least influence on the liver, and their action instead of being transmitted is chiefly confined to the bowels. So, then, as a rule, we shall find that those cathartic medicines which are extremely irritating to the mucous membrane of the bowels produce but very little increase in the biliary discharge. To substantiate this as well as many other facts which we have stated in this paper, we beg leave to refer to the important and praiseworthy "Experiments on the Biliary Secretion of the Dog," made by Dr. Rutherford and M. Vignal, and published in the January and October numbers

(1876) of the *Journal of Anatomy and Physiology*. Thus, for example, we shall find that croton-oil, elaterium, scammony, etc., which are active irritants, and produce a copious discharge from, besides giving rise to a great amount of congestion in, the alimentary canal, have but a comparatively slight action on the liver; while, on the other hand, podophyllin, calomel, aloes, ipecacuanha, etc., which cause less irritation of the mucous surface of the bowels, have a decided tendency to increase the discharge of bile. Nor is this all; but a small dose of the same cathartic medicine, as croton-oil, for example, will cause more bile to be excreted than a larger dose; the former naturally produces less irritation in the alimentary tract than the latter, and this, at least, is one cause for the difference of effect in the two quantities.

From various experimental evidence and deductions we may then, in view of their therapeutic action, divide all cathartic medicines into three classes, viz.: 1. Those which principally affect the alimentary canal; 2. Those which principally act on the liver; and, 3. Those which operate on both these organs without tending to influence one more than the other. It must be remembered, however, that no strict line can be drawn between intestinal and hepatic cathartics, for none such exist; the cathartics which affect one will also affect the other, although with varying intensity. So, then, from experimental testimony, which we believe also accords with clinical evidence, we conclude that the intestinal cathartics are elaterium, croton-oil, scammony, gamboge, castor-oil, sulphur, salines, etc.; the hepatic cathartics are euonymin, ipecacuanha, podophyllin, sanguinarin, iridin, and colchicum; and the intestino-hepatic cathartics are calomel, leptandria, aloes, rhubarb, senna, colocynth, and jalap.

From the foregoing observations it will be seen that in cathartic medicines we possess a powerful lever with which we are able to influence, in a very marked manner, a large and important part of the animal economy; and, since the state of the alimentary canal and all its tributaries requires close attention in the treatment of every form of disease, it is evident that cathartics are very important therapeutic agents.

ART. IV.—*A Handy Aspirator.* By SIMON FITCH, M. D.
Edin., St. John, New Brunswick, Canada.

THIS is an India-rubber apparatus, like a Higginson or Davidson syringe, but with *treble thickness of all the walls*, which gives strong resilience and powerful suction to the bulb, and prevents possibility of obstruction from collapse of the tubes.

The aspirator-needle may be attached to either tube, for exhaustion or injection, and it may be worked with *one* hand while the needle is inserted and steadied with *the other*.

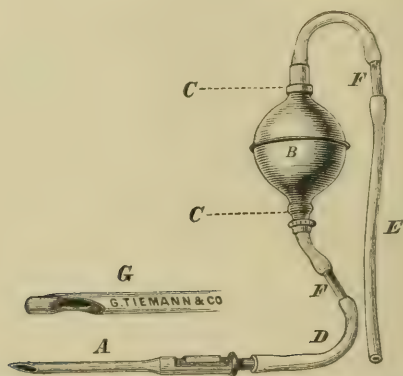
After the needle is introduced the bulb should be held upright, or perpendicular, with the orifice by which the fluid enters *below*, and the orifice of exit *above*; the valves at these two orifices will fall exactly into place, and regurgitation toward the needle will be impossible.

If the operation is to test the existence of fluid at uncertain depths, the bulb may be tightly squeezed till the point of the needle enters the surface; then the pressure may be relaxed, when the strong suction will discover fluid instantly upon the needle reaching it.

If the operation is to empty a cavity, as the bladder or pleura, then, after the current is established, by once or twice working of the bulb, the flow will continue of itself, from mere siphon-action, without further manipulation of the bulb; but if, from thickness of the fluid, or from the smallness of the needle, the stream seems sluggish, it may be quickened by working the bulb occasionally or continuously.

I have used this apparatus in hydrothorax and empyema, and in exploration of obscure abdominal and pelvic enlargements, with great satisfaction; and, with the *dome-trocar* needles of No. 1 and No. 4 sizes, it is available for all purposes of aspiration, and especially for cases requiring accurate steadiness of the inserted needle, as in tapping the pericardium and the joints; for, as the whole affair is managed by the operator alone, there will be complete unison between the hand holding the needle and the hand working the bulb.

Messrs. Tiemann make the instrument exceedingly well, with the *dome* needles, as described, and fit it into a very small case.



A represents the dome aspirator-needle, with the cutting-point projected, ready for puncture; *G*, a magnified diagram of the same, after insertion, with the dome advanced so as to protect the interior of the cavity during aspiration; *B*, bulb in upright position, to insure the best action of valves; *C*, valves; *D*, entrance-tube; *E*, exit-tube; *F*, bits of glass tubing through which to observe the presence or absence of fluid.

ART. V.—*Errors of the Sphygmograph.* By EDGAR HOLDEN, M. D., Ph. D.

AFTER the publication of observations in sphygmography, made with an artificial heart and rubber capillaries, in 1871, and the larger treatise on “The Sphygmograph” in 1873, it seemed appropriate that one who, in a measure a pioneer, had so pressed an unproved science before the profession should abandon the field to other workers. Since that time, therefore, I have abstained from contributions to medical journals, and, as a passive observer, have watched with attention the development of scientific interest in this direction.

That, as a science, it is yet hardly more than embryonic, is evident; and that through differences among its accoucheurs it may never survive delivery, seems its present greatest danger. As there are now in the field many zealous and confident laborers, any critical observations, if not to all wholly new, may have practical worth. It is perhaps already realized that, if any solid clinical value is to be derived from the

sphygmograph, there must be either the use of a single form of instrument, or comparisons must be limited to tracings taken by those similar in construction. Whether any of those now in the market can, in simplicity and practical application, supply all that is requisite to full success, remains to be proved.

In the tracings given below it seems best to withhold the names of the authors. The reasons will, perhaps, be obvious, although it should be stated that the records are not merely copies, but fac-similes, and the authors themselves men who are far from being tyros in the profession.

Any one who may have taken the trouble to collate, or examine critically, the contributions on the subject scattered through the periodicals of the day, must have been struck by the apparent want of distinctive significance of many tracings, as evidenced by their groupings under circumstances the most diverse, and the conclusion from such discovery must have been anything but complimentary to the powers of the instrument. While we think this can be satisfactorily explained, the chief fault in the premises lies in the fact that too much is expected of it. It is not, and never can become, the sole means of determining disease. Like many other modern appliances, it may be of great importance as an assistant, and often of inestimable value, where the precise condition of the circulatory or nervous systems is to be determined. To expect too much is as serious an evil as to expect too little, and either may lead to unjust condemnation of a valuable discovery. All that can be said against the sphygmograph may be said of so useful an instrument as the clinical thermometer; and let the coming device for pulse-record be but as easy of adaptation as the latter, and it will occupy as prominent a position in our armamentarium.

Aside from the error of expecting too much from the sphygmograph, as we now have it, are those errors already alluded to in the tracings presented in our periodicals during the past seven or eight years.

These may, for convenience, be classified as follows, viz.: errors of comparison, of observation, and of interpretation.

They are, however, so blended as to be with difficulty con-

sidered apart. With regard to the first, errors may arise through comparison of records taken by different forms of instrument, or of those taken at different degrees of pressure, or of those taken upon different arteries, or at different rates of speed, and so great may be these differences as to vitiate the importance of the observation. To illustrate: the first event in a tracing which, as is well known, is due to the transmitted shock of the heart's systole, and which precedes the distention of the artery, varies, so far as the instrument is concerned, according to the resistance in the instrument itself. If this could be absolutely nil, the primary ascent of the tracing would be quick, and lose its proper significance in proportion to the momentum obtained by the tracer, and might be so out of all proportion to the rest of the tracing as to make the line of descent involve the wave of inpulsion, the aortic notch, and even the diastolic portion itself. This may be seen by comparing tracings made with different degrees of resistance in a state of health, the speed of the watch-work being the same.

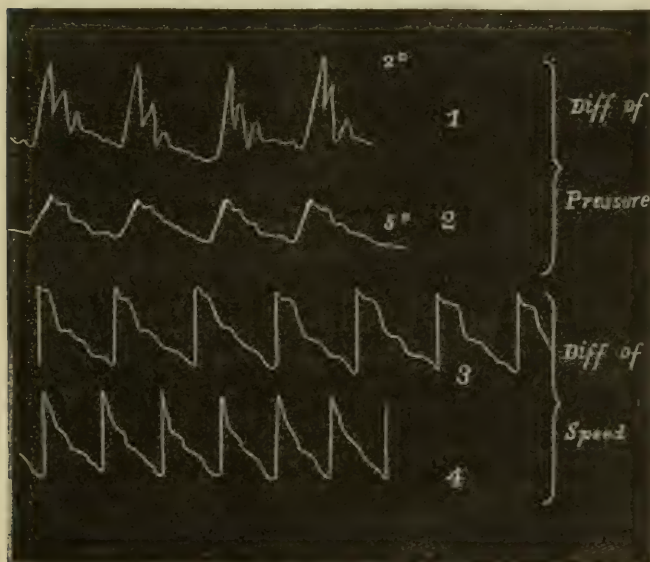
Now, this primary ascent of the tracing may be of importance in determining aortic regurgitation, or the amount of irritability, or the vigor of the heart's action, as in hypertrophy; and not only to the observer might the tracing from one instrument look unlike that of another of less resistance, but simple nervous excitement would give a tracing in the former case like that of hypertrophy in the latter.

This brings us to another point of considerable, nay, vital importance, viz., the comparison of tracings taken at different pressures; and George William Balfour, in his recent treatise on "Disease of the Heart," considers this difficulty in obtaining a uniform pressure almost sufficient to destroy the value of tracings in cardiac disease.

The records from the same instrument, on the same artery and at the same sitting, present the most marked difference at the different degrees of pressure. This may be seen in Fig. 1, Nos. 1 and 2. If, then, it is important to note carefully the pressure, and receive as correct only the one that gives us the greatest amplitude, when using a single instrument, how important must it be when comparing those whose

recorded degrees may vary in actual grammes! Of errors due to different rates of speed, Nos. 3 and 4 on Fig. 3 are examples.

FIG. 1.

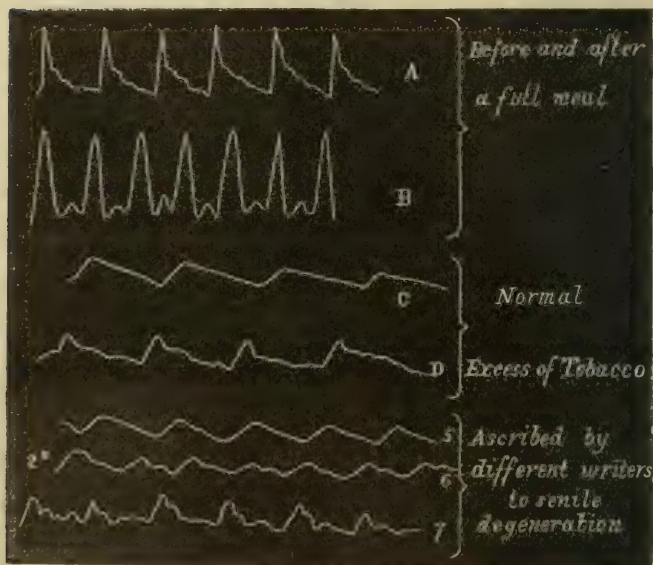


Errors of observation may, of course, be included among those already detailed, but there are some to be guarded against in which comparison has no part, viz., those arising from carelessness or hurry, from copying tracings, or from states of the system due to purely physiological causes, such as a full meal, fatigue, etc. The publication of tracings from persons suffering from organic disease as the true exponents of such disease, without regard to their condition as to these points, can only lead to a still greater confusion and the disrepute of the sphygmograph. All these states change materially the tracing of health, and would be even more likely to modify that of disease. See *A, B, C, and D*, on Fig. 2.

Another important error in this direction, which is also one of interpretation, may be seen in Nos. 5, 6, and 7, where that which by several writers is given as a normal record

of health is presented by another as a tracing of aortic obstruction, and by another still as of senile degeneration.

FIG. 2.



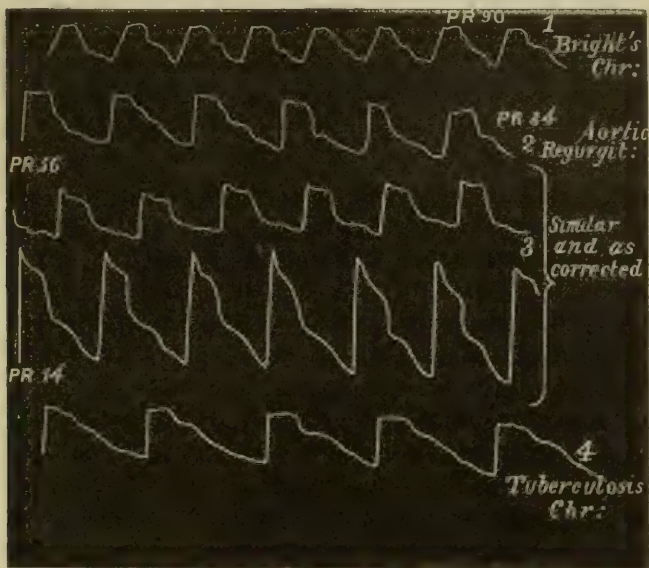
With reference to errors of interpretation, it may be remarked that, if we ask what we may reasonably be expected to read in a tracing, when taken with a due regard to the physiological condition of the patient, the degree of pressure calculated to give the greatest amplitude, and the form of instrument used, we shall be able to judge of the correctness of tracings put forward as exponents of certain conditions.

For example, suppose the tracing correctly taken, and that it is a fac-simile, and not an off-hand copy, of the record, we can read: 1. The character and force of the transmitted shock of the heart's systole. 2. The relative ease with which the distensile artery receives the on-rushing current of blood; the character, as regards firmness, hesitancy, or force, of the propelling power of the heart and larger arteries; the condition of the artery under observation; and, in a measure, the condition of the capillaries through which the contained current must find exit.

A singular and not easily-explained error may arise where aortic regurgitation exists. When the heart, under the stimulus of the regurgitant flow, has come into a state of hyper-excitation, the tracing, before exhibiting unmistakable evidence of regurgitation, gives the low, flat-topped record of high arterial tension, the sudden drop of arterial collapse having disappeared. In such case a proper adaptation of pressure can alone yield a correct record.

The tracings on Fig. 3 have been published, and may be compared. The first was given as the high-tension pulse of Bright's disease; the second as of regurgitant disease of the aortic valves; the third as of similar disease in another case corrected by altering pressure; the fourth as of chronic tuberculosis pulmonalis.

FIG. 3.



It would be easy to multiply cases likely to mislead, which have appeared under the impress of considerable authority, but it is not my desire to hold up as faults of the science the negligence of its votaries. Only the difficulties of practical and ready application have stood in the way of a natural correction of these errors by the emulation of observers; and if

this article shall call the attention of those who are using or are about to use the instrument to the necessity of greater caution, some little good will result.

As a summary of conclusions deducible from the errors alluded to, it may be said :

1. That, in all tracings published, the reader should be informed of the prominent features of a case, if one of disease; and, if one of supposed health, of the condition as regards meals, exercise, habits, and temperament.

2. The degree of pressure employed should be stated.

3. The instrument used, and the rate of speed, with the number of pulsations by actual count, should be given, as well also as the name of the artery tried.

4. The greatest care should be exercised not only to obtain a perfect record, but *the record* which, after several efforts, at different pressure, is found to be the true exponent of the condition.

Clinical Records from Private and Hospital Practice.

I.—*Fracture at the Superior Epiphysis of the Humerus.*

By CHARLES H. RICHMOND, M. D., Livonia, N. Y.

FIVE or six years ago I treated a case of separation of the superior epiphysis of the humerus occurring in a girl ten years old. The descriptions found in the books were not uniform and did not exactly correspond with the appearance of my case, while some authorities merely incidentally alluded to the occurrence of the injury. The separation was produced by a fall backward from a height of three or four feet, the deformity consisting in a forward and outward projection of the lower fragment, and attended with a little shortening and a rounded margin of the projection. The crepitus was not sharp, but seemed muffled. After a short time the deformity was marked by swelling, and, after the discontinuance of the treatment (by means of a leather splint fitted to the outside of the shoulder

during extension), the deformity existed as at the time of fracture. Time, however, has smoothed it down.

In 1874 Dr. E. M. Moore, of Rochester, N. Y., read a paper before the American Medical Association on "Epiphyseal Fracture of the Superior Extremity of the Humerus," demonstrating the exact relations of the displaced fragments. He claims that the outer edge of the epiphysis is carried upward, and the superior end of the lower fragment being carried forward and outward, its prominent inner angle rests in the concavity of the epiphysis at about its middle. His plan of treatment is, to carry the arm forward and upward while moderately extended: the upper fragment rolls upward in the glenoid cavity until arrested by the capsular ligament, when the lower fragment slips into its normal relation with the former. The arm may be brought down to the side in a state of moderate extension and easily held in position by a Swinburne extension-splint.

Hamilton, in the fifth edition of "Fractures and Dislocations," accepts Moore's views of the nature of the injury and plan of treatment, but says he has had cases in which the lower fragment was thrown completely out of the socket of the epiphysis.

I have quite recently treated a case of this injury illustrating the plan of treatment advocated by Moore and recommended by Hamilton. A young man nineteen years old (as old as any on record, I think) fell backward a distance of about six feet from the ground, producing a separation of the superior epiphysis of the humerus. I saw the case about an hour and a half after the accident; a considerable swelling had taken place, yet there was a slight depression beneath the acromion, with the characteristic forward and outward projection a little below. As I raised the arm, at the same time carrying it forward, I detected a slight or "muffled" (Moore) crepitus, while the parts resumed their normal relations. On bringing the arm, moderately extended, down to the side, the normal position was retained, and there was no seeming inclination on the part of the fragments to become displaced. I applied an outside splint, extemporizing an extension by means of adhesive plaster applied to the inside of the

arm, carried below the elbow and around the lower end of the splint, thence through a hole in the splint, to the outside of the arm and beneath the board. The lower end of the splint was padded in order to prevent excoriation of the outer condyle. Counter-extension was made by means of an axillary band fastened to the upper end of the splint, which extended somewhat above the shoulder. The whole was secured by a bandage, the forearm held at a right angle. At the completion of the treatment, which lasted between four and five weeks, the result was *perfect*.

My object in this article is not to give a complete description of the injury in question, but to report a couple of cases illustrating the value of the most recently-advised treatment as compared with former methods.

ART. II.—*Embolism of the Popliteal from Verrucose Vegetation of the Aortic Valves.* By J. A. ANDERSON, M. D., Hill's Ferry, California.

Mrs. B., aged forty-seven. The patient complained of severe "shortness of breath," following the slightest exertion. Upon auscultating the heart, a very loud diastolic murmur was heard, which entirely replaced the second sound. This murmur reached its maximum intensity at the third right intercostal space. The first sound was weak, and also accompanied by a murmur when auscultated at the above point. There was no well-marked hypertrophy, although the area of cardiac dullness seemed to extend farther to the left than normal. A succinct history of recurring, subacute, articular rheumatism was given.

A diagnosis of aortic insufficiency, together with a certain degree of stenosis, was made, although at the time I had no distinct idea of the nature of the valvular lesions.

The treatment consisted in rather free doses of digitalis, combined with bitter stomachics. Proper hygienic rules were enforced, and the patient cautioned against sudden or over-exertion and violent mental emotions.

There was no material change in the symptoms for some

six weeks, when the patient suddenly experienced a partial paralysis of the lower extremities. There was marked loss of sensation in both limbs, but in the right from the knee downward it was totally absent. Motion was very little impaired upon the left side; in the right more so, but in both only in the same way as in locomotor ataxia—a feeling as though no limb were there, rather than an inability to move it. In the left limb the circulation was unimpaired; in the right pulsation could be felt in the femoral throughout its entire course; but in the popliteal it suddenly ceased, and below this no trace of it could be discovered upon the most careful palpation. The temperature of the limb below this point was very low—far below the normal temperature of the body. Auscultation of the heart revealed a marked change. The second sound was now audible, and the murmurs accompanying both sounds were lessened very much in intensity and duration.

From all these data—the loss of sensation, the low temperature of the limb, the absence of circulation, and the general paraplegic shock—I concluded that a warty vegetation, growing probably upon the aortic valves, had become detached, and, entering the general circulation, had lodged in and occluded the popliteal artery at about its lower third.

The case was treated precisely as though the artery had been ligated. Artificial heat, cotton swathings, and hand frictions, were resorted to so sedulously that the limb was actually burned at one point before the *entire* absence of sensation was discovered. I must confess that I looked forward to gangrene, but was agreeably disappointed to see, after a time, the warmth and circulation gradually restored. The loss of sensation remained almost the same, and at length I placed the patient upon daily electrical treatment, using a constant-current battery of my own construction, of about the strength of eight Daniell cells. Under this treatment she gradually improved; first experiencing unpleasant, disordered nervous sensations, which slowly gave place to normal ones, until at the end of three months she declared herself quite “cured.”

I have kept the patient under observation two years; treating her not long since for an indigestion due to torpidity

of the bowels from lack of nervous energy, which yielded promptly to the administration of strychnia. Her general health is moderately good. She suffers little discomfort from her heart-trouble, but is highly hysterical, experiencing not long since a paraplegic attack of a purely hysterical nature. While not longing for her demise, I yet hope to be able some time to verify the rare diagnosis made in this interesting case by a *post-mortem* examination.

III.—*A Case of Axillary Aneurism successfully treated by Shot-Bag Pressure, during the Service of Dr. B. A. Watson, at Jersey City Charity Hospital.* Reported by HENRY D. FRY, M. D., House Physician and Surgeon.

GEORGE ROBSON, aged fifty-three, native of England, occupation gardener, was admitted into the Charity Hospital July 14, 1877, and gave the following history :

During the month of August, 1876, he first noticed a pain in his left arm just above the elbow, extending from thence upward to the shoulder and shooting down the forearm to the fingers, followed in a short time by swelling of his hand and wrist. Previous to this time he had always enjoyed excellent health, with the exception of a chancre contracted some twenty years before, succeeded by slight secondary symptoms. These pains continued during the following winter, at times becoming so severe as to necessitate complete rest from work, when, in March, he sought medical aid, and was treated for rheumatism without any beneficial result. Upon admission he complained of what he called his "rheumatic pains," which were paroxysmally increased, and also mentioned having "a lump" under his arm, first observed by himself about two months ago.

Inspection revealed an elastic, oval tumor about the size of a goose-egg, situated at the outer aspect of the infra-clavicular region of the left side, and bulging forward that portion of the pectoral muscles corresponding to the anterior wall of the axilla. Pulsation, eccentric in character and synchronous with the heart's action, was distinctly felt over the

tumor, and also perceptible by pressing deeply downward into the supra-clavicular region or upward against the floor of the axilla. Compression applied to the third portion of the subclavian artery completely suppressed all pulsation in the tumor below, as well as the bruit, which was plainly obtained by auscultation at other times.

I shall briefly state the treatment employed in the case preceding that of the successful application of the shot-bag. During the first few weeks after entrance, up to August 3d, one drachm of potassium iodide was given daily without any apparent effect. On August 5th the patient was ordered a diet composed wholly of lean meat, together with total exclusion of all liquids, and absolute rest in bed. This was continued forty-eight hours, with a similar result.

August 7th.—Compression was made upon the subclavian artery as it passes over the first rib, by means of a padded key, firmly pressed into the supra-clavicular region and maintained for twenty-two hours. Result unsuccessful; several days' rest allowed; and on August 11th compression repeated in same manner for twenty-six hours. The sac, after these trials of indirect proximal pressure, continued to pulsate with an equal force; while the character of the tumor became altered, being sensibly increased in size, and more compressible.

The patient was propped up in bed in a semi-sitting position, and pressure upon the subclavian by means of the shot-bag first resorted to on August 17th. A description of its construction and suspension is unnecessary—being essentially similar to that described by Dr. Burke in this journal of last June—although I shall mention one point in the apparatus, the importance attached to which, in these cases, would probably be but too little appreciated; and that is, the necessity of a rubber intervening between the shot-bag and its suspending cord. Should the patient's position become slightly altered, either higher or lower, through the elasticity obtained by this means, the weight will also follow, ascending or descending, as the case may be, without any material change of the compression-force exerted by the bag upon the artery. In this instance pressure was ineffectually continued for fifty hours; and,

although all pulsation was completely controlled while remaining applied directly to the vessel, any slight lateral movement of the patient's body would cause the bag to slip out of place, and thus make it interrupted in character rather than continuous. The failure on this occasion did not by any means prove the futility of the plan, but, on the contrary, owing to the entire control of pulsation exercised by the bag when in position, encouraged hope of ultimate success under more favorable circumstances. To obtain this, the necessity of keeping the vessel compressed immovable, in order to secure and maintain a proper adjustment of the weight, was clearly evident, and for this purpose the following apparatus was constructed by Dr. Watson's directions :

A long box or trough was made, about four inches deep, having no bottom, within which the patient is to sit after it is placed upon the bed—the mattress then forming its floor. The sides of the box are separated at a greater distance at one end to accommodate the width of the pelvis, and, gradually approaching each other toward the opposite extremity, are united by a double foot-board of convenient size ; the inner one being movable by a screw, so as to lengthen or shorten the distance within the box, as may be necessary to place the board at a suitable point to afford a firm support against which to brace the feet. To the other or broad extremity is fastened, by hinges, a cushioned back, with a prop behind extending to the floor, so arranged that the back may be placed upon an inclined plane, affording support to the patient's body at whatever angle may be desired.

This was completed on August 21st, and on the same day the patient was arranged in position, as described.

Sand-bags were placed between the lower extremities to keep them immovable, and the space between the patient's limb and side of the box closely packed with cotton batting. A broad bandage, extending from armpit to waist, was next tightly bound around his body and the back of the apparatus, confining the left arm by passing over it, but allowing the right to remain free.

Thus secured, and the back inclined at an angle of 110° , the shot-bag was applied.

A constant watch being kept by Drs. Titus and McMartin, the direction of the pressure was so regulated that for the following twenty-four hours no pulsation whatever could be detected in the aneurism, excepting a short period in the beginning of, and once during, the application. At the expiration of this time signs of solidification were apparent, and, after continuing the compression interruptedly for another twenty-four hours, the process was completed, the tumor then appearing hard, inelastic, and with entire absence of pulsation.

Regarding the employment of this method of treatment in axillary aneurisms, Erichsen, in his "Surgery," says:¹ "Digital compression might be advantageously used, but compression by instruments on the cardiac side can seldom be made applicable to aneurisms in this situation; inasmuch as the pressure that is brought to bear upon the subclavian must necessarily at the same time influence the greater part of the brachial plexus of nerves to such an extent as to be unendurable by the patient. *Yet it is not impracticable, and means might be devised to overcome this difficulty.*"

In this instance severe pain was complained of after a few hours' application; but this, as well as all restlessness, was entirely controlled by opium administered until its full anodyne effect was obtained; although at no time was narcotism carried to such an extent as to produce stertorous breathing, nor the patient so far under the influence of the drug but that he could be easily aroused, and kept so by conversing with him. The pulse, respiration, and temperature reached, but never exceeded, 120, 30, and 101° respectively. This occurred within twenty-four hours after applying pressure, and was, with a slight elevation during the first few days succeeding its removal, the only change noticeable.

As an effect of the continued pressure of the weight, an oval slough was produced at the point of contact with the integument; likewise entire loss of sensation as well as motion of the left upper extremity. This, together with no pulse detected at the wrist, constituted the condition of the patient as presented within a few days after solidification of the aneu-

¹ Vol. ii., page 121.

ism; from which time improvement of the different symptoms commenced and continued with varying degrees of rapidity up to the present moment of writing, September 22d—a space of thirty days. During this interval the following changes occurred:

The slough separated on September 5th, and cicatrization has since advanced so rapidly as at present to procure complete repair of the ulcer.

Sensation returned in a day or so, limited at first to the shoulder and upper part of the arm, gradually extending from thence down the arm and forearm to the hand, until entirely restored.

Electricity was applied on September 1st, and repeated morning and evening for one week before exciting muscular irritability, contractions being then first observed in the biceps and triceps muscles. The patient now possesses some little voluntary motion of the arm.

Circulation became so far restored as to render the pulsations of the radial artery perceptible on September 8th.

The history of the case as it now stands is completed; and admitting, as thereby proved, that axillary aneurism can be cured by shot-bag pressure when properly applied, the question arises, What advantage, if any, has this mode of treatment over digital compression? Even though digital compression applied here might have yielded an equally successful result if intrusted only to competent hands, still it is inferior to the shot-bag, the latter possessing at least two great advantages. In the first place, by it the pressure can be made absolutely continuous in character—an object not attainable by digital compression, inasmuch as each change of an assistant necessitates a removal and reapplication of the pressure; and, again, whereas the one requires for its efficacy a relay of skillful attendants to make proper compression, in the other it is only necessary to see that the pressure obtained by the weight is directly applied to the artery—a duty comparatively easy, and requiring the employment of but two assistants.

Notes of Hospital Practice.

RIVERSIDE HOSPITAL, BLACKWELL'S ISLAND.

SERVICE OF DR. J. J. DELANEY.

Antipyretic Treatment in Typhoid Fever, Scarlet Fever, and Diphtheria.—**Typhoid Fever.**—The following records of antipyretic treatment will prove particularly interesting at the present time, when typhoid fever is so frequent. Liebermeister, in his article on "Typhoid" in the first volume of Ziemssen, in which he speaks so favorably of the benefit obtained by lowering the temperature by the abstraction of animal heat, does not follow out the progress of an individual case, and thus fails to convey to the mind of the reader the exact results which he must expect during the course of the fever when treated by the wet pack. The method practised was to place the patient on a canvas bed, and, after covering with a sheet, pour on water at the ordinary temperature.

Daniel Murphy entered the hospital August 18th, suffering from typhoid fever. He had been ill one week. The special symptoms complained of were general *malaise*, epistaxis, diarrhœa, and latterly delirium at night. There were no rose-colored spots on the body, but there was considerable pain in the right inguinal fossa.

August 18th.—5 P. M., $103\frac{1}{2}^{\circ}$; 7 P. M., 104° . The patient was placed in the pack for an hour. 8 P. M., 101° ; 9 P. M., $101\frac{1}{2}^{\circ}$.

19th.—1 A. M., $103\frac{1}{2}^{\circ}$. Placed in a pack for an hour. 2 A. M., 101° ; 4 A. M., 102° ; 6 A. M., $102\frac{1}{2}^{\circ}$. Wet pack for an hour. 7 A. M., 100° ; 9 A. M., $102\frac{1}{2}^{\circ}$. Wet pack for an hour. 10 A. M., $100\frac{3}{4}^{\circ}$; 12.15 P. M., $101\frac{1}{2}^{\circ}$; 4 P. M., 103° . Wet pack one hour. 5 P. M., 101° ; 6 P. M., 102° ; 8 P. M., 103° . Given thirty grains of quinine. 10 P. M., $102\frac{3}{4}^{\circ}$; 11 P. M., 103° ; 12 P. M., $102\frac{1}{2}^{\circ}$.

20th.—1 A. M., 102° ; 3 A. M., $101\frac{1}{2}^{\circ}$; 5 A. M., 101° ; 7 A. M., 101° ; 9 A. M., 100° ; 11 A. M., 101° ; 1 P. M., 101° ; 2.30 P. M.,

$102\frac{1}{2}^{\circ}$; 3 P. M., 103° . Given thirty grains quinine at 3.30 P. M. 5.40 P. M., 102° ; 7.40 P. M., $102\frac{1}{2}^{\circ}$; 9 P. M., 102° ; 11 P. M., $101\frac{1}{2}^{\circ}$.

21st.—2 A. M., 102° ; 5 A. M., 103° . Wet pack one hour. 6 A. M., $100\frac{1}{2}^{\circ}$; 7 A. M., 101° ; 9 A. M., $101\frac{1}{2}^{\circ}$; 11 A. M., 104° . Wet pack one hour. 12 M., 101° ; 4 P. M., 103° . Wet pack fifteen minutes. 4.15 P. M., $100\frac{1}{2}^{\circ}$; 5 P. M., $102\frac{1}{2}^{\circ}$. Wet pack one hour. 6 P. M., 101° ; 7 P. M., 101° ; 10 P. M., $102\frac{1}{4}^{\circ}$; 11 P. M., 103° . Wet pack one hour. 12 P. M., $100\frac{1}{2}^{\circ}$.

22d.—2 A. M., $102\frac{1}{2}^{\circ}$. Wet pack one hour. 3 A. M., 100° ; 5 A. M., $102\frac{1}{4}^{\circ}$. Wet pack one hour. 6 A. M., $99\frac{1}{2}^{\circ}$; 7 A. M., 101° ; 9 A. M., 101° ; 12 M., $102\frac{1}{2}^{\circ}$. Wet pack one hour. 1 P. M., 100° ; 2 P. M., 103° . Given forty grains of quinine at 2 P. M. 3 P. M., $101\frac{1}{2}^{\circ}$; 5 P. M., $101\frac{1}{4}^{\circ}$; 7 P. M., $100\frac{1}{2}^{\circ}$; 9 P. M., 101° ; 11 P. M., 101° .

23d.—1 A. M., $100\frac{1}{2}^{\circ}$; 3 A. M., 101° ; 5 A. M., $100\frac{1}{2}^{\circ}$; 8 A. M., 101° ; 12 M., 102° ; 3 P. M., $102\frac{1}{2}^{\circ}$. Wet pack one hour. 4 P. M., 100° ; 6 P. M., $103\frac{1}{2}^{\circ}$. Wet pack one hour. 7 P. M., $100\frac{1}{2}^{\circ}$; 8 P. M., $102\frac{1}{4}^{\circ}$; 9 P. M., 104° . Wet pack one hour. 10 P. M., $100\frac{1}{2}^{\circ}$; 12 P. M., $101\frac{1}{2}^{\circ}$.

24th.—2 A. M., 101° ; 3 A. M., $101\frac{3}{4}^{\circ}$. Wet pack one hour. 4 A. M., $99\frac{1}{2}^{\circ}$; 6 A. M., $100\frac{1}{4}^{\circ}$; 9 A. M., $101\frac{1}{2}^{\circ}$; 12 M., 102° . Wet pack one hour. 1 P. M., 100° ; 2 P. M., 102° ; 4 P. M., 104° . Wet pack one hour. 5 P. M., 101° ; 6 P. M., 103° . Given thirty grains of quinine at 6 P. M. 9 P. M., $103\frac{1}{2}^{\circ}$. Wet pack one hour. 10 P. M., $100\frac{1}{2}^{\circ}$.

25th.—12 M., 102° ; 2 A. M., $102\frac{1}{4}^{\circ}$; 3 A. M., $102\frac{1}{2}^{\circ}$. Wet pack one hour. 4 A. M., $100\frac{1}{2}^{\circ}$; 6 A. M., $102\frac{3}{4}^{\circ}$. Wet pack one hour. 7 A. M., 100° ; 11.15 A. M., $103\frac{1}{2}^{\circ}$; 12 M., 102° ; 1 P. M., 103° ; 2 P. M., $103\frac{1}{4}^{\circ}$; 4 P. M., 103° ; 6.30 P. M., $104\frac{1}{2}^{\circ}$. Wet pack thirty minutes. 7 P. M., 101° ; 8 P. M., $103\frac{1}{2}^{\circ}$. Wet pack twenty minutes. 8.20 P. M., 101° ; 9 P. M., 102° ; 11 P. M., 103° .

26th.—12 A. M., $101\frac{1}{2}^{\circ}$; 2 A. M., $102\frac{1}{2}^{\circ}$. Wet pack thirty minutes. 2.20 A. M., $100\frac{1}{2}^{\circ}$; 3 A. M., $102\frac{1}{2}^{\circ}$. Body sponged, $101\frac{1}{2}^{\circ}$; 5 A. M., $102\frac{1}{2}^{\circ}$. Body sponged, 101° ; 7 A. M., $102\frac{1}{2}^{\circ}$. Body sponged, $100\frac{1}{2}^{\circ}$; 8 A. M., 103° . Wet pack twenty minutes. 8.20 A. M., 101° ; 10 A. M., 102° ; 11 A. M., 103° . Wet pack fifteen minutes. 11.15 A. M., 101° ; 1 P. M., $102\frac{1}{2}^{\circ}$; 3

P. M., 103° ; 5 P. M., $102\frac{1}{2}^{\circ}$; 6 P. M., $101\frac{1}{2}^{\circ}$; 8 P. M., 101° ; 11 P. M., 100° ; 12 M., 101° .

27th.—1 A. M., $102\frac{1}{4}^{\circ}$. Wet pack twenty minutes. 1.20 A. M., 100° ; 3 A. M., $100\frac{3}{2}^{\circ}$; 5 A. M., 101° ; 6 A. M., 102° . Wet pack twenty minutes. 6.20 A. M., $99\frac{1}{2}^{\circ}$; 7 A. M., 100° ; 9 A. M., $100\frac{1}{2}^{\circ}$; 11 A. M., $101\frac{1}{2}^{\circ}$; 12 M., 102° ; 1 P. M., $101\frac{1}{2}^{\circ}$; 2 P. M., $101\frac{1}{2}^{\circ}$; 3 P. M., $101\frac{1}{2}^{\circ}$; 4 P. M., $101\frac{1}{2}^{\circ}$; 5 P. M., 102° ; 6.30 P. M., $102\frac{1}{4}^{\circ}$; 7.30 P. M., $102\frac{1}{2}^{\circ}$; 11.30 P. M., $102\frac{1}{2}^{\circ}$.

28th.—12.30 A. M., 102° ; 5 A. M., 103° . Twenty grains of quinine. 7 A. M., 101° ; 9 A. M., 100° ; 11 A. M., 101° ; 6 P. M., 102° . Thirty grains of quinine. 8 P. M., 102° ; 12 P. M., 102° .

29th.—2 A. M., $101\frac{1}{2}^{\circ}$; 4 A. M., 101° ; 6 A. M., 100° ; 12 M., $100\frac{1}{2}^{\circ}$; 6 P. M., $101\frac{1}{4}^{\circ}$; 12 P. M., 101° .

30th.—2 A. M., 101° ; 6 A. M., $99\frac{1}{2}^{\circ}$; 12 M., 102° ; 2 P. M., $102\frac{1}{2}^{\circ}$. Thirty grains of quinine. 4 P. M., 103° ; 6 P. M., $103\frac{1}{2}^{\circ}$; 7 P. M., 103° ; 8 P. M., $102\frac{3}{4}^{\circ}$; 11 P. M., $101\frac{1}{2}^{\circ}$.

31st.—1 A. M., 101° ; 6 A. M., 100° ; 8 A. M., $99\frac{1}{2}^{\circ}$; 12 M., 101° ; 2 P. M., $102\frac{1}{2}^{\circ}$. Thirty grains of quinine. 4 P. M., 102° ; 6 P. M., $102\frac{1}{2}^{\circ}$; 12 P. M., 101° .

September 1st.—2 A. M., 101° ; 6 A. M., $99\frac{3}{4}^{\circ}$; 12 M., $99\frac{1}{2}^{\circ}$; 7 P. M., 103° . Thirty grains of quinine. 9 P. M., $100\frac{1}{2}^{\circ}$; 12 P. M., 100° .

2d.—6 A. M., 99° ; 6 P. M., 101° .

3d.—6 A. M., 99° ; 6 P. M., 102° .

4th.—6 A. M., $99\frac{1}{2}^{\circ}$; 6 P. M., 103° . Thirty grains of quinine.

5th.—6 A. M., $98\frac{1}{2}^{\circ}$; 6 P. M., 102° .

6th.—6 A. M., 99° ; 6 P. M., $101\frac{1}{4}^{\circ}$.

7th.—6 A. M., 99° ; 6 P. M., $101\frac{1}{2}^{\circ}$.

8th.—6 A. M., 99° ; 6 P. M., $100\frac{3}{4}^{\circ}$.

9th.—6 A. M., $98\frac{1}{2}^{\circ}$; 6 P. M., $100\frac{1}{2}^{\circ}$.

10th.—6 A. M., 99° .

Convalescence at this last time was established, inasmuch as the temperature never rose above $99\frac{1}{2}^{\circ}$.

Scarlet Fever.—In scarlet fever the wet pack has also been had recourse to, and with a result which will be seen in the following case:

Catharine Moran, aged twenty-five, entered the hospital

August 8th, suffering from scarlet fever. She first noticed a sore-throat on August 6th.

August 8th.—6 P. M., 99° .

9th.—8 A. M., 103° ; 7 P. M., 105° . Wet pack from 7.30 till 12 P. M. 12 P. M., 101° .

10th.—During this day the eruption appeared. 2 A. M., 103° . Wet pack one hour. 3 A. M., 101° ; 6 A. M., 102° ; 9 A. M., $104\frac{1}{2}$. Wet pack three hours. 12 M., $99\frac{1}{2}$; 1 P. M., $103\frac{3}{4}$. Wet pack till 6 P. M. 6 P. M., 102° ; 7 P. M., $103\frac{1}{2}$. Wet pack till 9 P. M. 9 P. M., 101° ; 11 P. M., 103° . Wet pack till 1 A. M., August 11th.

11th.—1 A. M., $102\frac{1}{2}$; 7 A. M., $103\frac{3}{4}$. Wet pack one hour. 8 A. M., 100° ; 6 P. M., 102° ; 9 P. M., 99° . Eruption disappearing, and patient much improved.

Diphtheria.—A case of diphtheria with high temperature was treated with the cold pack, with the following result:

James Condon, aged six years, was admitted August 11, 1871, suffering from an attack of diphtheria, which had set in two days previously.

August 11th.—5.30 P. M., 104° ; 10 P. M., $105\frac{3}{4}$. Wet pack for ninety minutes. 12 P. M., 102° .

12th.—6 A. M., $102\frac{1}{4}$; 8 A. M., $104\frac{1}{2}$. Wet pack for four hours. 12 M., 105° ; 2 P. M., $104\frac{3}{4}$. Wet pack for five hours. 7 P. M., $104\frac{1}{2}$. Wet pack ten minutes. 7.10 P. M., 99° ; 9 P. M., $104\frac{1}{2}$. Wet pack five hours.

13th.—2 A. M., $102\frac{1}{2}$; 4 A. M., $103\frac{1}{4}$. Wet pack three hours and thirty minutes. 7.30 A. M., $102\frac{3}{4}$; 9 A. M., $104\frac{1}{4}$. Cold bath seven minutes. 9.07 A. M., 100° ; 11 A. M., $103\frac{1}{2}$. Wet pack one hour. 12 M., $101\frac{1}{2}$; 6 P. M., 104° ; 7 P. M., 105° . Wet pack two hours. 9 P. M., 103° . Wet pack two hours. 11 P. M., $101\frac{1}{2}$.

14th.—7 A. M., 100° ; 6 P. M., 99° .

15th.—7 A. M., 100° ; 6 P. M., 102° .

16th.—7 A. M., 102° ; 6 P. M., $99\frac{1}{2}$.

Subsequently to August 16th the temperature did not exceed 100° .

Correspondence.

THE OPERATION OF TRACHEOTOMY.

CAMBRIDGE, MASS., *September 15, 1877.*

EDITOR NEW YORK MEDICAL JOURNAL :

I READ with especial interest Dr. Reid's description of his method of tracheotomy, published in the July number of your JOURNAL.

I write only for the purpose of urging a trial of this method by the profession, believing that it simplifies and materially lessens the danger of the operation, which, if performed when demanded, must usually be done by the general practitioner rather than by the skilled surgeon.

For a number of years I have practiced, and many times demonstrated to the members of the profession, an operation essentially similar to that of Dr. Reid—possibly, in some respects, to be preferred.

When the dissection of the superjacent tissues has been completed, I insert a barbed tenaculum (Perry's, of New York) into the trachea, at a point elected for the superior limit of the incision, and, thus held and lifted out, open it as desired.

An assistant separates the incision with two fine hooks, by lifting the cut edges from each other, rather than by piercing the trachea laterally, as Dr. Reid does; and, having freed the tenaculum, thus held, the tube is applied.

The possible advantages of this method over that of Dr. Reid are these :

The trachea is held by the operator's own hand, and is not at all under the care of an assistant.

The barbed hook removes all danger of slipping, and places the trachea completely under the control of the operator—an advantage of no slight value when we remember the rise and fall of the parts under the impeded respiration usually accompanying and rendering the operation necessary.

The antero-posterior diameter of the trachea is not lessened, as in Dr. Reid's method, but materially increased, thus

rendering less likely an injury, by the knife, of the posterior wall of the trachea—an accident which has more than once happened to experienced operators. The trachea sustains no injury except in the line of the incision.

Owing to the difficulties of the operation (which it may be hoped, are greatly lessened by these simple modifications by Dr. Reid or myself), many patients are allowed to die, where surgical interference would, to say the least, materially add to the chances of recovery.

In all these cases, let the exigency be fairly met, and prompt, at least temporary, relief afforded.

If not at hand, it is not necessary to wait even for a tracheotomy-tube; for, by stitching the skin to the edge of the trachea, and fastening the sutures to pieces of adhesive plaster applied to the neck, the wound may be kept open.

This method, original with Dr. H. A. Martin, of Boston, is claimed by him to possess advantages in some respects over the use of the tube, allowing a freer exit to secretion, membrane, etc., not being likely to clog, requiring less care, and in many instances is to be preferred.

HENRY O. MARCY, M. D.

Clinical Reports of the Demilt Dispensary.

CLASS IN DISEASES OF CHILDREN.

BY DR. P. BRYNBERG PORTER.

Hydrocephalus in a Syphilitic Infant ; Recovery.—Mary U., aged six months, was brought to the Dispensary September 12, 1876. The mother, who is unusually intelligent, stated that, though she was but twenty-nine years of age, she had had no less than eleven children. Some of them were still-born, however, and most of the others died when very young. Only two are living at present—the oldest, who was born when the mother was only fifteen, and this infant. Mrs. U. con-

fessed that she had been the victim of syphilis, and said that two of her offspring had already died from "water on the brain." The child presented well-marked evidences of hereditary syphilis, as well as the most unmistakable marks of hydrocephalus. I regret that I did not take the measurements of the head, which was disproportionately large in comparison with the rest of the body; while the anterior fontanelle was of enormous extent, and the whole surface of the cranium covered with turgescient veins. There was some strabismus, but it was not very marked. The child was artificially fed, and was quite feeble, and very pallid in appearance. The mother seemed very anxious to save the infant, if possible, and had therefore taken the trouble to come from Greenpoint, where she resides, to seek medical advice in reference to it; but, under the circumstances, I could only give a most unfavorable prognosis, and it was for this reason that I thought it hardly worth while to measure the size of the head. I told her, however, that I would do what I could for her in the way of treatment, and since that time she has, as a rule, been quite faithful in her attendance at the Dispensary. The first medicine I ordered was the iodide of potassium, in three-grain doses. I also gave careful directions, of course, in regard to the alimentation and general care of the child; and, in addition, if I remember rightly, told the mother to put a small quantity of brandy in its milk.

September 19th.—Diarrhœa having set in, I stopped the iodide of potassium, and ordered a simple emulsion of castor-oil, with a little paregoric.

28th.—The diarrhœa well. Ordered three grains of the iodide of potassium, and $\frac{1}{2}$ of a grain of bichloride of mercury three times a day.

October 26th.—The child no worse in any respect, and apparently a little stronger. Increased the iodide of potassium to $3\frac{3}{4}$ grains, and the bichloride of mercury to $\frac{1}{4}$ of a grain.

November 23d.—Increased the iodide to five grains, and the bichloride to $\frac{1}{16}$ of a grain.

December 7th.—The child seems to have been gradually improving since September. Is stronger and better in every

way, while the strabismus has almost entirely disappeared, and the head is apparently no larger than when the patient was first seen. Ordered the same treatment continued.

January 25th.—Diarrhœa having again set in, the treatment was now intermitted, and the castor-oil emulsion substituted for it. The irritability of the bowels seems to be due, in part at least, to dentition. No strabismus is now noticeable.

30th.—The child has just cut her first two teeth, the middle incisors of the lower jaw, though she is now more than ten months old. The diarrhœa still continuing, the bicarbonate of soda and subnitrate of bismuth, with a small quantity of Dover's powder, were ordered.

February 6th.—Is very feverish at night, this probably being due also to the irritation of teething. The condition of the bowels is improved, but they are still frequently troublesome. I now combined two grains of quinine with the bismuth and Dover's powder, three times a day.

27th.—The bowels still loose. The head perspires exceedingly freely, and the child seems quite weak. Ordered *hydrargyrum cum creta* (one grain), in combination with bismuth, three times a day, and, in addition, brandy, as occasion required.

April 3d.—Under the above treatment the patient seems to have picked up quite nicely, and the bowels are now in excellent condition. There is at present, however, some enlargement of the cervical glands noted. Ordered the syrup of iodide of iron and cod-liver oil internally, and mercurial ointment to be applied externally to the enlarged glands.

May 5th.—The child has cut a number of back teeth recently, and the enlargement of the cervical glands above noted was probably due to this cause. They have now returned to their natural size. The pure cod-liver oil not agreeing well with the patient, I ordered Wyeth's emulsion of the oil in its stead.

June 25th.—Under the last treatment the child seems to have been thriving to a very gratifying degree, and is now growing nicely.

September 10th.—It would be difficult to recognize, in the

large and comparatively healthy-looking child now presented, the puny and hydrocephalic infant brought to the Dispensary just a year ago. The anterior fontanelle seems at the present to be closing up rapidly; the veins over the surface of the cranium, before so swollen and tense, are not at all prominent; and the ruddy hue of the skin everywhere shows a natural and healthy capillary circulation. The head is apparently but slightly larger than it was a twelvemonth since, while the rest of the body has developed to a most remarkable extent. The child has passed through its second summer in a very satisfactory manner, having been troubled only by an occasional temporary looseness of the bowels. It eats and sleeps well, and seems quite strong; so that there appears to be no reason now why it should not grow up to maturity and live to a good old age.

Croup. CASE I.—Mary McL., aged two years and nine months.

June 13th.—During the last three or four days the child has suffered from a hoarse cough, and within forty-eight hours the mother has noticed increasing difficulty of breathing. The child now has considerable fever, the characteristic croupal cough and voice, and a good deal of dyspnoea, with pretty well-marked stridulous inspiration. The fauces show a diffused redness, and some tumefaction, but no false membranes are discernible upon their surface. Auscultation of the chest shows that there is bronchitis also present. I ordered a powder of three grains of the yellow sulphate of mercury every two hours, until the difficulty of breathing was relieved. If the child was not better by the next morning, the district physician was to be sent for.

15th.—The patient very much improved, the respiration now being quite natural, and the anxious expression of countenance, which was before very marked, having entirely disappeared. The turpeth mineral caused prompt emesis, and it was necessary to repeat it only once or twice. I could not ascertain whether there were any fragments of fibrinous exudation in the matter vomited. There is still considerable cough, but it is simply of the character of that of ordinary bronchitis, and there is still some redness of the fauces. Or-

dered chlorate of potassium and tincture of galls, with syrup of tolu and "brown mixture" every hour or two, and the turpeth mineral to be repeated should there be any return of the urgent symptoms. After this, as I subsequently learned, the child had no further trouble.

CASE II.—John B., aged two years and three months.

February 27th.—In this case the symptoms were much the same as in the last one, except that there was but little bronchitis present, and the dyspnoea was considerably more urgent. The child was evidently in great danger; but I did not regard tracheotomy justifiable until other means had been tried.

Ordered two and a half grains of the yellow sulphate of mercury every two hours until the dyspnoea was relieved, and a mixture containing chlorate of potassium and the tincture of the chloride of iron every hour. In addition the child to be kept in an atmosphere of steam, which was to be generated by pouring small quantities of water upon flat irons kept heated for the purpose. Should there be no improvement by the next morning, the district physician was to be sent for.

March 1st.—The mother says the effect of the powders was magical. Prompt emesis was caused by the first one, affording great relief; but after the second he vomited a tough white mass, which, according to the description of the mother, who was a woman of some intelligence, must, no doubt, have consisted of false membrane, forming a complete cast of the larynx and trachea. Unfortunately, she did not preserve it to bring to the Dispensary. The child afterward made a good recovery, and has not had any return of the disease since.

CASE III.—Patrick F., aged three years.

December 23d.—Another well-marked case of croup, with considerable bronchitis, as in the first case. Ordered chlorate of potassium, tincture of the chloride of iron and glycerine every hour, and three grains of the yellow sulphate of mercury every two hours, if necessary.

26th.—Immediate relief followed the vomiting caused by the turpeth mineral, and all unfavorable symptoms have now

disappeared. The treatment from this time was changed to the syrups of squill and senega, with brown mixture, and the patient continued to do well.

The above three cases, as well as some others in which I have tried it, serve to show the prompt and efficient effect of turpeth mineral (given in accordance with the practice of Dr. Fordyce Barker) in many instances of croup. Unfortunately, however, it does not always act so happily, and I have seen other cases which steadily progressed to a fatal termination, notwithstanding its use; although in these the result might possibly have been different had the patients been seen somewhat earlier in the course of the disease. Nevertheless, I cannot refrain from offering my testimony in its favor, as a most useful remedy, and one which is entirely devoid of danger or any unpleasant consequences.

Persistent Congenital Icterus in a Rachitical Infant.—Adolph V., aged three and a half months, was brought to the Dispensary November 2, 1876. The mother appeared to be very feeble and anæmic. She had had a great deal of mental anxiety on account of the confiscation of some property in Cuba, of which island she is a native, and said she suffered constantly from neuralgia. She had had five children previous to this one. The two oldest ones, aged eleven and sixteen respectively, were in good health, but the last three had been weakly children; two being carried off in early infancy by diarrhœal disease, and the third falling a victim to whooping-cough combined with pneumonia at the age of two years. The present child was a very puny and poorly-developed infant, and the skin and conjunctiva were very deeply icterosed, the color being dark enough to approach that which is seen in what is known as “black jaundice.”

This condition, the mother stated, was seen at birth, and had continued uninterruptedly from that time on. The child had been artificially fed from the first, and had been given a great deal of starchy food. It was naturally very fretful and worrisome, appearing to be almost constantly in pain, slept but little, and for some time previously had been suffering from diarrhœa. The urine was of a deep-yellow color. None of the other children, the mother said, had ever been affected

with jaundice. From the continuance of the yellow discoloration from birth, I concluded the case to be one of some congenital deficiency in the biliary ducts, a condition which, according to West and other authorities, is fatal, though life may be prolonged for a few months. I therefore gave a very unfavorable prognosis, and prescribed only some simple remedy for the diarrhœa, which was evidently weakening the infant considerably, in addition to giving advice as to the proper method of feeding it. Brandy in small doses was also ordered.

November 13th.—The diarrhœa has disappeared, and the general condition of the child seems slightly improved, though there is no perceptible difference in the icterosed condition of the skin and conjunctiva. I now commenced a course of alkaline treatment, with the idea that there might possibly be no congenital malformation, and feeling assured that it would do no harm in case there were.

December 16th.—The child has now been under observation for a month and a half, and there is found to be some change, though not very marked, in the yellow discoloration. This improvement is more noticeable in the conjunctiva than in the skin, on account of the naturally dark and sallow complexion of the child. There has been some diarrhœa occasionally, and the stools have sometimes been green; but the mother thinks the infant a great deal better in every way, and this is certainly indicated in its appearance. Among the other signs of improvement, it is noted that the face has not the same pinched and anxious expression which it had at first.

January 18th.—The jaundice has improved very greatly since the last note, though marks of its presence are still quite noticeable. Evidences of rachitis, however, are now beginning to be seen. The head sweats a great deal during sleep, the pillow being frequently wet with it; the hair is worn from the occiput by the burrowing of the latter into the pillow; there is some bronchial catarrh; the lifting of the child by the hands upon the chest-walls seems to occasion it pain, and the bowels continue in an irritable condition, sometimes being relaxed and sometimes costive. Under these circum-

stances I ordered a mixture of the syrup of iodide of iron and cod-liver oil.

February 10th.—All vestiges of the jaundice have now disappeared, and it is therefore necessary to look for some other cause for it than the congenital deficiency of ducts which at first suggested itself. The most probable explanation seems to me to be, that there was originally a congestion of the duodenal mucous membrane, or the biliary passages (or perhaps both), and that this resulted in a subacute catarrhal condition of the same. It is certainly remarkable, however, that the jaundice should have continued so long, and it is possible that there may have been some unknown source of obstruction which eventually passed away. Still, it is well known that the yellow discoloration not infrequently persists for some time after the cause of the attack of jaundice is removed.

September 26th.—The child has been seen from time to time during the interval that has elapsed since the date of the last note, and there has been no return whatever of the jaundice. The rachitis has continued to progress in spite of the treatment; but the child is now growing quite nicely, and seems to have a fair chance of eventually becoming entirely healthy if watched with care. It is thirteen months old, and has six teeth, which it began to cut late. The first teeth to protrude were the upper middle incisors, and this is a sign of rachitis, to which, I believe, Dr. A. Jacobi was the first to call attention. This cutting of the upper incisors first is an evidence, in his opinion, of premature ossification of the skull. In addition, we find the square head with prominent forehead, the wide-open anterior fontanelle, the chicken-breast, the beaded ribs, and the extremities of the long bones, so characteristic of the rachitical diathesis.

Tape-Worm in a Child Three and a half Years Old.—Emma F., aged three years and seven months, was brought to the Dispensary June 2d. The child was stated to have always enjoyed very good health, and the mother had not noticed anything unusual about her recently. About ten days previously, however, she noticed two or three joints of a tape-worm in one of her passages. She then gave her a dose of

rhubarb, and the next day she passed a large number of joints adherent to one another, and making a connected piece nearly a yard in length. After that she had passed a joint or two at a time occasionally, and on the morning of the day she came about twenty or thirty at once, for the most part disconnected, without having taken any cathartic or other medicine previously. I desired to try, in this case, the effect of pumpkin-seed, which has been so lauded in the treatment of tape-worm, but, not having it convenient, I ordered five grains of santonine night and morning until five powders had been taken, and this to be followed by a full dose of castor-oil. In the meanwhile all the passages were to be carefully watched.

June 9th.—After the oil had been taken she passed about an inch and a half of the worm, which differed greatly in appearance from the portions which had been passed before. These had been still alive, as a rule, as well as plump in outline, and comparatively dark in color. This latter piece, however, was quite dead, and was white and shriveled in appearance. Moreover, the segments were smaller and more attenuated, being apparently from near the head, though the head itself was not found. Up to the present time, more than four months since the case first came under observation, no other fragments of *tænia* have been seen in the child's passages; and it may therefore probably be concluded that the worm was gotten rid of at that time. It is an interesting question whether the santonine had anything to do with this favorable result or not. I have not seen it mentioned in the books as a remedy for *tænia*, and my reason for giving it was simply because I had always found it so useful in the more common varieties of intestinal worms. Flint says it is a matter of observation that the parasite is apt to die when separation takes place near the head; and so perhaps death would have occurred in this instance, even if the santonine had not been given.

Tape-Worm in a Child of Three Years.—Thomas R., aged six years, was brought to the Dispensary September 20, 1877.

According to the account of the mother, who seemed to be trustworthy, and a person of some education, the child began passing portions of tape-worm no less than three years before.

Previously to that time it had been noticed that he was very peevish and cross, and that he did not sleep well at night. There were no other symptoms that she remembered. After a time he was placed under medical treatment, and, though he continued to pass fragments of the worm, it did not seem to be gotten rid of until about a year ago, when he passed a number of very narrow joints, and one like a minute point, which the physician thought was the head. After that he did not pass any more pieces for two or three months, when they began to make their appearance in the fæces again, and have continued to do so from time to time ever since. He is actually said to have passed several yards at a time—the mass being still alive. Though the mother brought none of the fragments with her, she described their appearance so accurately that there could not be any doubt about their being joints of the *tænia solium*. It is possible that in this case, after one worm was expelled, another became developed. I ordered *santonine*, as in the preceding case; but, much to my chagrin, the patient was not brought back afterward, and, as I had been given an incorrect address, I unfortunately lost sight of him altogether.

Proceedings of Societies.

NEW YORK PATHOLOGICAL SOCIETY.

Stated Meeting, September 12, 1877.

Dr. E. G. JANEWAY, President.

Osteo-Periostitis simulating Articular Rheumatism.—Dr. H. C. Post presented a necrosed portion of the humerus, removed from a boy aged fourteen years. The history of the case was interesting, inasmuch as it proved that osteo-periostitis might readily be mistaken for acute articular rheumatism. The boy was attacked with pain in both shoulders and one hip, and the attending physician made a diagnosis of rheumatism.

The disease, however, terminated in the suppuration of the joints, and when seen by Dr. Post about a year after the first symptoms appeared, there was found to be necrosis of the left humerus, extending down to near the elbow. The right humerus was similarly, but not so extensively, affected, and there was also a sinus leading toward the left sacro-iliac synchondrosis.

Dr. Post saw, in consultation, only a few weeks subsequently, a case which closely corresponded to the previous one. The patient was a boy aged twelve years, who was attacked with pain in the left shoulder, right elbow, and right knee. Suppuration subsequently ensued in the shoulder-joint, and when seen by Dr. Post there was necrosis for a space of two inches below the epiphysis. This was removed, and after three weeks the epiphysis regained its vitality. The inflammation in the other joints did not pass on to suppuration.

Cystitis.—Dr. Post also presented a bladder and kidneys in which the cystic mucous membrane was thickened and eroded. The right kidney was slightly atrophied. The pelvis was dilated, from a stricture of the ureter. The president thought that hospital patients were more liable to cystitis, for the reason that, from deficient cleanliness, bacteria would develop in the urinals, and contaminate the bladders of those using them.

Dr. SEGUIN thought that it was very important that urinals and catheters should be kept scrupulously clean, particularly where they were used for paraplegic cases.

Dr. BRIDDON had known private patients to have worn urinal pouches for years without inconvenience. In regard to the specimen of osteo-periostitis, he had somewhat similar case in patients recovering from smallpox and scarlet-fever.

Sudden Death in Cardiac Disease.—Dr. AUSTIN FLINT presented a heart which was removed from a patient who died suddenly. The interest of the case arose from the fact that there were no lesions to account for the symptoms. The patient drove to Dr. Flint's house, and with difficulty entered. An examination revealed no particular lesion, but from the tumultuous action of the heart it was considered wise to examine him on the following day. It was then found that

there was a systolic bruit not extending beyond the apex. The contractions of the organ were frequent, but not weak. During the afternoon the patient was seized with a fit of unconsciousness, which lasted for a few moments, and was attended with cyanosis. The pulse was regular, and moderately strong. During the night another attack came on, from which the patient died. An examination of the heart showed that the valves were normal, and that there were no membranous deposits in the columnæ carneæ. The gross appearances of the organ would indicate a certain amount of fatty degeneration.

Dr. JANEWAY thought that fatty degeneration was held to be the cause of a larger number of deaths than it should be. Particularly was this true in cases of death from chloroform.

Carcinoma of the Stomach.—Dr. E. C. SEGUIN presented a specimen of cancer of the stomach, which he had seen in consultation with Dr. Thurman. The patient was a woman aged seventy-five years. For the past eighteen months she had been failing in health, and during the last year she complained of nausea and anorexia, with marked emaciation and debility. Dr. Thurman detected a painless tumor below the left border of the ribs, and it was then supposed by both gentlemen to be impacted fæces. Enemata were administered, and at the same time the tumor was manipulated. In a few days it seemed to disappear. Last December the symptoms became more urgent, but vomiting occurred only two weeks before death, and was not severe. A tumor appeared on the median line shortly after the disappearance of the previous one, and was recognized as being cancerous. This was verified at the autopsy. A microscopical examination showed it to be composed of cylindrical epithelium. The most important feature of the case was the absence of pain.

Dr. BRIDDON referred to a case in which the diagnosis was made from the progressive emaciation.

Dr. FLINT said the absence of severe pain was the rule.

Dr. PUTNAM JACOBI said that it was important, in cases where there was emaciation simply, to exclude progressive pernicious anæmia and the prodromic stage of leucæmia.

Dr. JANEWAY thought that vomiting was most frequent when the deposit occurred near the pylorus, for the reason that in that situation the peristalsis of the stomach was liable to be interfered with.

Cyst of Spleen.—Exploration by Simon's Method.—Dr. BRIDDON exhibited a specimen of cyst of the spleen, with the following history: A woman aged thirty-six was admitted to the Presbyterian Hospital July 14, 1877. Three months previously she noticed a lump about the size of an egg in her left side, about an inch above the middle of the crest of the ilium. This continued to increase in size, without causing much pain, until July 4th, when its growth became more rapid, and attended with considerable pain. On admission, an examination revealed a tumor the size of a foetal head, situated in the left iliac and lumbar regions. The upper part was covered by the ribs, but the lower margin was readily distinguished by the fingers. It was nodular and elastic, and not connected with the uterus. The aspirator-needle was inserted, and a small amount of an amber-colored fluid withdrawn. This, when analyzed, was found to have a specific gravity of 1020, and to be albuminous. Under the microscope, there was found granular matter, with a few blood-corpuscles, but neither cholesterine nor any of the constituents of the urine.

July 27th.—Dr. Briddon, after consultation, introduced his hand into the rectum, and satisfied himself that the tumor was connected with the spleen.

28th.—During the night the patient was restless. In the morning, signs of peritonitis developed. At noon, passed into a state of collapse. Died in the evening, twenty-seven hours after the exploration. The autopsy was made twenty hours after death, but the body was very much decomposed; the heart was seemingly normal; lungs showed pleuritic adhesions on the right side; the abdomen showed evidences of peritonitis, and a large amount of gray fluid in the dependent portion of the cavity. The tumor proved to be mainly the spleen, which measured ten and a half inches in one diameter by five in the other. On the anterior surface an opening led to an irregularly-collapsed cavity in the substance of the organ. Dr. Briddon could not decide, on ac-

count of the decomposition, whether the tumor was a cyst or hæmatoma. He said that in the introduction of the hand great care was used, and he did not believe that any harm would have resulted if the spleen had been healthy.

Irregular Position of the Viscera.—Dr. JANEWAY exhibited photographs which had been obtained from a patient who died in Bellevue Hospital. There was congenital malposition of the heart, liver, and spleen. The condition was recognized before death. It was at first supposed that dislocation of the heart was caused by the existence of hydro-pneumothorax, but a more thorough examination revealed the true position of the organs. The autopsy showed transposition of the heart, liver, spleen, large intestines, cæcum, sigmoid flexure, and arterial distribution.

Death of the late Dr. John A. Brady ; Distention and Rupture of the Bile-Duct ; Abscess of Diaphragm.—Dr. JANEWAY described the autopsy made on the late Dr. Brady, of Brooklyn. The body was deeply jaundiced. The left pleural cavity contained fluid, and at the apex of the lung there was a small amount of lymph. The lower lobe of the right lung showed evidences of lobular pneumonia. The abdomen revealed the presence of recent peritonitis. The pyloric extremity of the stomach, duodenum, and transverse colon were adherent to the under-surface of the liver. In removing the liver, with adherent viscera, the left half of the diaphragm was noticed to be filled with pus. The ductus communis choledochus was found to contain a porous black calculus an inch and a half in diameter. On following up the bile-ducts, they were found dilated from the obstruction, and at some points suppuration had taken place. There was also rupture of one of the distended ducts, causing abscess of the diaphragm, peritonitis, pleuritis, and pericarditis.

Dr. FLINT said that Dr. Brady had attacks of hepatic colic fourteen years ago. They were accompanied by the passage of biliary calculi. Two or three years ago there were indications of similar attacks, but not distinctly marked. One week before he died another attack of colic set in ; this readily subsided, but a few days subsequently a second seizure occurred, followed by peritonitis, and death in forty-eight hours.

Stated Meeting, September 26, 1877.

Dr. F. V. WHITE in the Chair.

Removal of Lymphatic Glands from a Child.—Dr. A. C. POST presented a mass of lymphatic glands, weighing about two pounds, which he removed from a child four years of age. The first evidences of enlargement were noticed about a year previous, and at first they increased slowly; latterly, however, they grew very rapidly, and began to impede respiration. At the time of operation the mass extended from the lower jaw to the clavicle, and inward toward the median line. The operation was tedious, extending over a period of two hours, during which time the patient was under the influence of ether. A suggestion of the late Dr. Alexander H. Stevens was found to be of marked benefit in avoiding hæmorrhage. It was, to cut directly down on the mass, and then enucleate as far as possible, using the knife merely to cut bands of connective tissue. In this way, although the enlarged glands skirted along the dilated vessels, no dangerous hæmorrhage followed. It was feared that the prolonged anæsthesia might possibly prove fatal, and the mother of the child was forewarned. Fortunately, however, both the pulse and respiration continued good. On the morning following the operation the child was able to sit up in bed.

In answer to a question, Dr. Post said the suggestion of Dr. Stevens applied only to benign tumors. In malignant tumors it was an important principle to err on the safe side, and remove as much of the surrounding tissues as possible, so as to lessen the chances of recurrence.

Recurrent Fibroid.—Dr. FINNEL presented, on behalf of Dr. Little, a tumor which had been removed from a woman at St. Vincent's Hospital. The interest of the case rested mainly on the fact of the tendency to recur without any loss of strength in the patient, or any sign of malignancy. The patient first noticed a small tumor in the back, about thirty-seven years ago. It was removed by a surgeon in Dublin. A tumor again appeared in the same region twenty years subsequently,

and in three years grew to the size of the fist. It was also removed. After a period of three and a half years it again recurred, and reached the same size in seven months. After its removal it returned for the fourth time, and was the specimen presented by Dr. Finnel. It weighed about four pounds. During the period that the successive tumors were appearing, she bore thirteen children. After the operation the condition of the patient was good. The specimen was referred to the microscopical committee.

Scirrhus Tumor of Ileum; Tortuous Condition of Descending Colon.—Dr. SATTERTHWAITE presented a rare specimen which was obtained from a patient who died at the Presbyterian Hospital. A woman aged forty-nine entered August 13, 1877, stating that for the past eighteen months she had suffered severe pain in the abdomen. Six months ago the pain became quite severe, and was accompanied by loss of flesh and strength. On admission, the patient was jaundiced. The paroxysms of pain occurred every five minutes, and were followed by vomiting.

August 16th.—Has had no movement of the bowels. Since entering, vomits coffee-ground substance. The jaundice thought to be due to cancer.

23d.—Has improved in her general condition.

September 1st.—No change. Had slight passage from bowels. After consultation, an enema of one pint and a half of hot water was administered, but with no result, the enema being retained.

5th.—Has had a fair evacuation.

10th.—Pain returned. Bowels again moved.

13th.—Died.

Autopsy.—The descending colon was found bent upon itself, like the letter *s*, at a point about four inches below the spleen. It was held in that position by adhesions, but the stricture was large enough to allow the finger to be insinuated through it. The ileum, near the ileo-cæcal valve, was found to be the seat of scirrhus cancer. The gut was found very much distended, and, upon making section, an accumulation of twenty-three prune-stones, as well as a number of orange and grape seeds, was discovered. Dr. Satterthwaite said that no

connection existed between the cancerous ileum and the strictured colon. Numerous ulcers were noticed in the mucous membrane of the ileum, caused, in all probability, by the foreign bodies.

Cancer of the Omentum.—Dr. FINNEL recited the history of a case of cancer of the omentum, which was of interest from the large number of diagnoses made. The patient was a woman forty-five years of age. During the six months previous to her death she became quite weak, but no symptom was detected beyond an enlargement of the abdomen. No pain was complained of, but debility increased, and the patient died in St. Vincent's Hospital. At the autopsy there was found to be cauliflower-cancer of the omentum, weighing about two or three pounds. In the cavity of the abdomen there was a quart of pus.

Stated Meeting, October 10, 1877.

Dr. E. G. JANEWAY, President.

Aneurism of the Innominate Artery.—Dr. DELAFIELD presented, on behalf of a candidate, a specimen of aneurism of the innominate artery, in which the symptoms pointed to chronic laryngitis. The patient entered hospital July 12, 1877, suffering from difficulty of breathing, and in an anæmic condition. There seemed to be considerable difficulty in swallowing, but on watching the patient closely it was found to be due to the pain which was caused by the passage of the bolus over the larynx. An examination by the laryngoscope showed the presence of laryngitis. Moist *râles* were heard over the chest, but along the course of the trachea they were very distinct. During the stay in hospital, attacks of dyspnœa were of frequent occurrence. At first they were not marked in character, but gradually they became so severe as to compel the patient to sit up in bed. In one of the attacks the patient died.

Autopsy.—The heart and aorta normal. An aneurism of the innominate artery, the size of a pigeon's-egg, was found

to press on the trachea and nearly obliterate its cavity. The aneurism was of the sacculated variety, and in it was found a clot. The mucous membrane of the trachea was inflamed.

There were evidences of pleurisy on either side, as well as of lobular pneumonia. Dr. Delafield said that, practically, the results of the aneurism of the innominate were the same as in aneurism of the arch of the aorta; and the cause of inability to make a diagnosis was due to the laryngitis, which obscured the case.

General Carcinosis.—Dr. SEGUIN presented, on behalf of a candidate, specimens of general carcinosis. The patient had been under treatment at the New York Hospital by Dr. Woolsey Johnson, and was sixty-three years of age. Last spring œdema of the feet set in, and shortly afterward there were evidences of ascites. Subsequently, epigastric pain with vomiting appeared, resulting in death from exhaustion.

The autopsy showed that the patient was suffering from general carcinosis, and was of great interest from its rarity. The body was much emaciated.

The stomach formed an ovoid mass, measuring seven by four and a half inches. It was the seat of colloid cancer. The walls were thickened on the anterior surface to two and a half inches, on the posterior nearly an inch. The pericardium was as rough as sand-paper. The pleuræ were inflamed. The diaphragm was three-fourths of an inch thick. Its tendon was cartilaginous. The free surface of the peritoneum was covered with granules. The mesentery and omentum were much thickened. The abdominal viscera were agglutinated in a mass.

Dr. DELAFIELD thought the case might be considered as one in which colloid cancer appeared in the stomach and then became disseminated through the system.

Multilocular Ovarian Cyst complicated by Pregnancy.—Dr. ERSKINE MASON presented the uterus of a patient upon whom ovariectomy had been performed. The interest of the case rested on the fact that there was a fœtus in the uterus, as well as a large ovarian cyst filling the cavity of the abdomen. A number of similar cases had been recorded, including nine by Spencer Wells.

The patient was thirty years of age, single, and entered Roosevelt Hospital July 30, 1877. Eighteen months previously the abdomen began to increase in size, beginning on the left side. This enlargement was at first slow, but during the past two months the increase was so rapid as to cause marked dyspnœa. A vaginal examination showed the uterus to be high up in the pelvis, and movable. The abdomen had distinct fluctuation, with an area of flatness not changed by the position of the patient. The measurements were: From the anterior spinous process of the one side to that of the other, nineteen inches. From the ensiform cartilage to the pubes, nineteen and a half inches. From the ensiform cartilage to either spinous process, ten inches. Circumference of the abdomen at the umbilicus, thirty-nine inches. Circumference of the abdomen at the spinous processes, thirty-eight and a half inches.

The patient was examined by one of the most expert ovariologists in the city, and was considered as a favorable case for operation. Ovariectomy was accordingly performed, and, on opening the abdomen, the trocar was passed into one cyst, and eight ounces of fluid evacuated. This, unfortunately, proved to be a pregnant uterus, and as soon as the mistake was discovered the uterus was closed with sutures and the abdominal walls brought together. The patient passed a restless night, and gave birth to a fœtus at the sixth month. Death occurred eighteen and a half hours after the operation. The autopsy revealed a large multilocular cyst of the left ovary. There was no blood in the cavity of the abdomen. The uterus was closely contracted. There were no evidences of peritonitis.

Dr. SAYRE said that too much credit could not be given to Dr. Mason for the frank manner in which he described the unfortunate issue of the operation, and he was of the opinion that, if other surgeons were equally honest in reporting cases, many more would be on record for the benefit of the profession.

Dr. JANEWAY referred to nine cases which Spencer Wells reported, in which pregnancy was found at the time of operation.

Use of Tincture of Iron in Fibro-cystic Tumors of the Thyroid Gland.—Dr. BEVERLY ROBINSON showed the photograph of a patient who was affected with a fibro-cystic tumor on the right side of the thyroid gland. The tumor was the size of an orange, and had been treated by evacuation without benefit. He first drew off its contents, and then injected tincture of iodine, but without advantage. Subsequently he used tincture of iron. Following the use of the tincture of iron, the cyst was converted into an abscess. Previous to treatment the circumference measured seventeen and a half inches, but at the time of report it was fifteen inches. Dr. Robinson said that he found, after emptying the cyst, that aphonia resulted for a short time. During previous evacuations the patient said that she had a similar experience. He asked the Society if any member could explain the pathology or physiology of such an occurrence. In some cases, reported in European journals, sudden death was found to supervene after the use of tincture of iron, but in the case presented to the Society nothing was noticed with the exception of the aphonia.

Intestinal Obstruction from Contraction of Fibrinous Effusion.

—Dr. JANEWAY recited an interesting case of intestinal obstruction in a young lady sixteen years of age, due to the contraction of membrane effused on the intestines. The patient had never been ill since she was two years of age, and at that time suffered from some pulmonic disease. Four weeks before death she was taken with vomiting and severe colicky pains, but in a few days she recovered completely. Her physician was of the opinion that she suffered from malaria, and gave her quinine. At the end of seven days she had a similar seizure, which also lasted for a few days, and resulted in recovery. Seven days subsequently she had a third seizure, when she was seen by Dr. Janeway. The intestines were distended with gas, but no tumor or source of obstruction was discovered (temperature 103°). In a few days she recovered, but was again taken with her usual symptoms seven days from her previous attack. Death took place from exhaustion. It was interesting to notice that the four attacks began seven days after the previous one, or at the beginning of each week, and lasted about three days, when they passed away. At the

autopsy the small intestines seemed shorter than usual. This was due to a puckering of the ileum about half an inch from the ileo-cæcal valve. This was caused by an effusion of lymph, which, by contracting, had drawn the intestines together. The peritonitis which had resulted in the effusion had, in all probability, occurred when the patient suffered from pleurisy and pneumonia, in her second year. There was also an adhesion of the spleen to the diaphragm. The intestines above the contraction were considerably dilated.

MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

Stated Meeting, September 24, 1877.

DR. JOHN C. PETERS, President.

DR. P. BRYNBERG PORTER read a paper on "An Analysis of the Examination of Seventy-seven Pregnant Women, with a Synopsis of their Labors." The paper was compiled from an obstetric hospital experience in Philadelphia, and was of interest from the careful manner in which each case was studied by the reader of the paper. The peculiar views of Dr. Isaac E. Taylor in regard to the cervix during labor were found to coincide with the experience of Dr. Porter.

Bibliographical and Literary Notes.

ART. I.—*Undersøegelser Angaaende Syphilis.* (Researches on Syphilis.) Ved Prof. Dr. W. BOECK. Christiania, 1875, 4to, 292 pp.

THE author of this large quarto of 292 pages says, in his preface, that it is a continuation of "*Recherches sur la Syphilis*," which was published in 1862. It contains an immense wealth of information in regard to the various phases of syphilis. In order to study the disease thoroughly, and to form

a more accurate opinion of the value of the various methods of treatment, it is important to keep the patients in sight for many years, as well as their children, and, if possible, their children's children. In no other part of the world is it possible to do this so thoroughly as in the country where Boeck made his observations.

The "Recherches" contained the statistics of all the syphilitic patients treated in the hospitals of Christiania from 1827 to 1856. The present work continues the same up to 1870, and gives, besides, all the information the author has been able to obtain concerning the patients referred to in the former. It is divided into three sections, the first two of which are statistical, and the third consists of general remarks concerning syphilis. Dr. H. Gjoer has analyzed the book very thoroughly and given an excellent *résumé* in the *Norsk Magazin for Laegevidenskaben*, 1876.

From 1827 to 1856 3,568 syphilitic patients were treated: 3,188 of these were treated with mercury for the first outbreak of constitutional syphilis; 107 of these died, the greater part during childhood. The mean period of treatment was 134 days; 1,035 had a relapse, 33 per cent., but, as some had several relapses, the total number of the latter is 1,672. One hundred and forty-three were treated with iodide of potash, 45 of these for secondary accidents. The mean duration of the treatment was 114 days; 18 had a relapse, 40 per cent.

Forty-five were treated with *diæta parca*; one death; duration of treatment, 129 days; 36 per cent. relapse.

Twenty-two were treated with decoction of sarsaparilla; two deaths; duration of treatment, 147 days; 30 per cent. relapse.

Sixty-three were treated by syphilization; four children died; duration of treatment, 147 days; 5 per cent. relapse.

It will be perceived that most of these were treated with mercury; in fact, this remedy was almost exclusively used until the last four years of the above-mentioned period.

In 1852 Boeck opposed the use of mercury, and at the same time commenced his *syphilization*. This produced a reaction, as is interestingly shown by the statistics from 1856 to 1870. The number of syphilitic patients in the hospitals

during this period was 2,451. Only 66 of these were treated with mercury, 14 died, one remained uncured; of the remaining 51, 20 had a relapse, 39 per cent.; the total number of relapses was 30.

One hundred and four were treated with iodide of potassium. The duration of treatment was 154 days; 39 per cent. relapse. In reality, however, the results were worse, as the patients from the military hospital could not be followed up after dismissal.

Twenty-six were treated with sarsaparilla; one uncured; duration of treatment, 100 days; 36 per cent. relapse.

Fifty-three were treated with essence of opium, 40 of these were children; 26 died; duration of treatment, 150 days; 18 per cent. relapse.

One thousand and five patients were treated by syphilization; 79 were under one year of age; 48 died, and of the latter 42 had hereditary syphilis; the duration of treatment was 162 days. Two hundred and one had a relapse, 21 per cent., but, as some had several relapses, the total number of the latter is 369. Syphilization has given better results in the National Hospital, both in Boeck's and Hjort's division, than in the Town Hospital. The percentage of relapses in the National Hospital does not exceed 16, while that of the Town Hospital is 35; the duration of treatment was also shorter in the former. This is due to the fact that in the latter only public women were treated. Their manner of life disposes to relapses, and the latter are more readily discovered on account of the frequent visitations and inspections. The separate results in the several places are given, but are here, for the sake of brevity, combined.

Six hundred and thirty-six were treated by derivation, antimonial plaster; two died, 25 remained uncured, 609 were cured; duration of treatment, 150 days; 148 had relapse, 24 per cent.; the total number of relapses was 298.

Three hundred and twenty-two were treated by external remedies; 33 died, 28 of the latter were under one year of age; 12 remained uncured, 277 were cured; duration of treatment 119 days; 29 per cent. relapse; the total number of relapses, 105.

Five were treated by *diæta parca*; duration of treatment, 140 days; three relapses.

The percentage of relapses above reported is interesting, but the information obtained concerning the subsequent health of the patients and of their offspring is still more valuable. Of the 6,013 patients reported in the "*Recherches*" and the present work, information has been obtained concerning the subsequent life of 951. Two hundred and sixty-four remained healthy, the others have had a variety of diseases, the most prominent of which were:

1. Apoplexy and Paralysis.

Thirty-one died apoplectic, 41 had paralysis at the time of observation; 14 had recovered from paralysis, and eight were reported dead of apoplexy. The total number of these diseases is, therefore, 94. In regard to sex, the male appears in the largest number, and the nerve-symptoms most commonly appeared between twenty and forty years of age. The period is given in 31 cases, and shows a mean period of fourteen years from the time of the initial lesion.

2. General Paralysis and other Mental Affections.

Ten men and four women died of general paralysis, after a mean period of sixteen years from the initial lesion. Five were suffering from this disease when the observation was made, making a total of 19. Ten men and three women are reported as dying from nervous affections after a mean period of seventeen years. Fifteen are furthermore mentally diseased, and 10 have been, but have now recovered. Fifty-seven are also reported as having suffered from general paralysis and other mental affections, and, adding these to the 94 of the previous group, we have a total of 151, or 15.8 per cent. who have had disease of the central organ of the nervous system. The males are also most numerous in this group, and Boeck thinks that the females are less liable in this direction, in consequence of the derivative action of pregnancy.

3. Phthisis.

Sixty patients, 18 males, 42 females, died of this disease after a mean period of twelve years after the treatment of their syphilis. Eighteen were still suffering from the disease at the time of observation, making a total of 78 with phthisis.

The information concerning the condition of the 264 healthy persons was obtained at a mean period of twenty-two years after their treatment for syphilis, and a number of them were old people. Boeck shows that syphilis contracted at a more advanced age is not so destructive of the organism as when the infection occurs at a more youthful period, or, more particularly, between twenty and thirty years of age. The average duration of life is shorter, however, in those who have had syphilis than in those who have not.

The cause of death of 102 is not given. Their death occurred after a mean period of sixteen years from their syphilis.

More or less accurate information was obtained concerning the condition of 688 women and their children. Fifty of these had never given birth, and 17 had not given birth after treatment for syphilis. Of the remainder, about 380 had given birth to only still-born, putrid, or syphilitic children, or children which died a few weeks after birth. One hundred and twenty had in addition to such also given birth to healthy children, and 130 had given birth only to healthy children.

It is stated as a general rule that a female who becomes syphilitic before puberty gives birth to healthy children, but exceptions also occur. If, on the contrary, the disease is contracted after puberty, it is rare that she gives birth only to healthy children. The first child a woman bears after a constitutional syphilis, acquired after puberty, is most frequently putrid or still-born, the second syphilitic and dies soon; the subsequent ones have more and more vitality, till, at last, only healthy children are born. There are, however, some exceptions to this order. Thus two or three examples are given in the statistics where the first child was healthy, and then birth was given to several syphilitic ones. When a woman who has had syphilis gives birth to a healthy child after having had syphilitic ones, it is by no means a rule that she continues to give birth to healthy children; she may have several syphilitic children, dead or putrid fetuses, before she again gives birth to a healthy child. When a woman contracts syphilis during the last two months of pregnancy, it is a rule that the child will be healthy; at least Boeck has observed a

well-marked example of this. When a woman has symptoms of tertiary syphilis, it is probable that she will give birth only to healthy children.

Boeck knew of but one case where syphilis was communicated from the father to the child. Other diseases, such as scrofula, meningitis, caries, etc., may, however, occur in the offspring as a result of the father's syphilis.

The third portion of the book consists of "General Remarks concerning Syphilis. The Syphilitic Virus."

Boeck made a series of inoculations with virus which had been mixed with various substances, or weakened in some other manner.

In the first place he collected the virus in common vaccine tubes, and found that when it was more than five days old it had no effect. Hence, if accidentally mingled with vaccine matter and used after the lapse of a week, syphilis would not be communicated.

Freezing destroys the activity of the virus after about the same period, and heating to 35–40° C. has the same effect; but the application of water heated to 40°, immediately after the inoculation, does not prevent the manifestation of the disease.

Thick crusts of syphilitic matter, softened in water, give no positive results when kept longer than twelve days; and lancets dipped in syphilitic matter without a thick crust have no effect after keeping for two days. The stories related of the communication of syphilis by Eustachian catheters are, therefore, for the most part, not true.

A number of substances were mingled with the virus used for inoculation, such as water, blood-serum, oil of cotton, alcohol, laudanum, solution of iodide of potash, sublimate, urine, liquor amnios, Fowler's solution, tartar-emetic, carbolic acid, boracic acid, glacial acetic acid, common pus, etc. Corrosive sublimate and glacial acetic acid proved the most destructive to the virus. One milligramme of sublimate, one drop of syphilitic matter, and 100 drops of water, constituted a mixture which gave a negative result. The water did not act destructively, since, as a rule, a positive result is obtained with one drop of syphilitic matter and 100 drops of water; the

negative result is due, therefore, to the sublimate. One drop of acetic acid has a destructive effect on a mixture of one drop of syphilitic matter and a varying quantity—from two to 500 drops—of water. Boeck tried the effect on artificially-inoculated chancres of sublimate solutions and dilute acetic acid, and found that the inoculability of the ulcer was not destroyed. The virus admits of a higher degree of dilution with common pus than with any other fluid before losing its activity. It may be diluted to a proportion of one to 1,100, and still be inoculable.

Primary Syphilis.—Boeck discusses Ricord's doctrine of two forms of chancre—the soft or non-infecting and the indurated or infecting sore, and endeavors to show that it is erroneous. He has always been a unicist, and sets forth his reasons at considerable length. The main points are, briefly, as follows :

1. The assertion that any chancre which heals without induration never is followed by constitutional syphilis does not always prove true. He has seen several cases of primary syphilis without induration which were, nevertheless, followed by constitutional syphilis in both males and females. This is often seen in the latter sex, though rarely in the former, except when the chancre is seated on the external surface of the penis. He has also on two occasions seen chancres with the most characteristic induration without subsequent syphilis. Both these cases were males. Their wives became affected with general constitutional syphilis, but the husbands remained healthy after a number of years, being frequently examined during that time.

2. Ricord's assertions, and those of his followers, that the soft chancre may be inoculated an infinite number of times, are manifestly untrue. It may be inoculated, as a rule, with great facility, and the ulcer produced may exist for a long time, but none who are experienced in syphilization will doubt that a period of immunity at last arrives where all attempts at inoculation produce no positive results, it matters not whether the matter has been taken from a hard or soft chancre. Boeck met with one case where he was unable to obtain a positive result a single time, either with pus from

soft or indurated chancres, though the attempt was frequently repeated. He also observed that in many cases the matter from soft chancres gave positive results only in a short series of inoculations. The inoculability of the soft chancre is, therefore, scarcely unlimited.

3. The assertion that matter from an indurated chancre cannot be inoculated with positive results, either on one who has a chancre or on one who has, or has had, constitutional syphilis, is also untrue. The rule is, that the first inoculation from the chancre does not take. It is only by repeated, daily inoculation that a positive result can be obtained. This was first demonstrated by Bidentkap and Melchior Robert. After a period of inoculation of from two to three weeks, papules are developed exactly similar to those produced by artificial inoculations of healthy individuals with syphilitic matter, and indolent buboes are also noticed in the vicinity of the papules. By irritating the indurated chancre with powdered savin, it is made to secrete a matter, inoculation with which produces characteristic pustules without induration, exactly similar to those produced by inoculation from soft chancres. Hence the author concludes that dualism is no longer tenable.

Experience with syphilization shows that the syphilitic matter may be of quite different intensity. Sometimes it can be reinoculated through many series, while at others it proves much weaker; this is frequently the case when the same matter has been used for a long time for numerous syphilizations. Boeck is of the opinion that the intense matter, by the strong reaction which it causes in the vicinity, forms a barrier to its further spreading, and it therefore remains local, while the weaker matter causes but little inflammation, and therefore readily passes beyond the lymphatic glands into the blood, and thus causes constitutional syphilis.

Treatment.—It is impossible to ascertain whether the poison is absorbed immediately, like snake-poison, or whether, like the poison of malignant pustule, it remains local for some time and is multiplied locally. Boeck thinks it may be possible to destroy it before absorption has taken place; and, therefore, in doubtful cases, and in cases of soft chancre, where he is uncertain as to the nature of the sore, he at once

uses destructive remedies, relying solely on the stronger ones, such as the actual cautery, caustic potash, Vienna paste, or the stronger acids. The above-mentioned experiment of inoculating syphilitic matter mingled with mercury seems to show that the latter has a destructive action on the virus exterior to the organism; but how far mercury can follow the virus through the sphere surrounding the sore, and also exercise a similar influence in the adjacent glands, is another question. In that case it might be applied to the ulcer immediately after its appearance, but Boeck thinks that more would be accomplished at this period with the stronger caustics. The oxide of mercury, which is so frequently used, is altogether too mild a caustic. Instead of injecting mercury beside the ulcer, it would be better to inject alkalies or acetic acid, and this only into the glands. Even if they did not prove beneficial, they would not harm the system, which Boeck thinks is always the case with mercury.

Syphilitic Buboes.—There are two varieties of bubo: the suppurating, which, as a rule, follows the soft chancre; and the indolent, which belongs to the indurated chancre.

1. The suppurating bubo is generally developed during the existence of the primary sore, and only very rarely after the latter has healed. The acceptance of the *bubon d'emblée* is regarded as the result of defective observation. It has always been preceded by an ulcer. It is the general opinion that constitutional syphilis does not exist where there is a suppurating bubo. Boeck has, however, seen a well-defined case where, notwithstanding the presence of a very characteristic suppurating bubo, constitutional syphilis of the most malignant form was developed. The virus from the suppurating bubo is generally more intense in its action than that from the ulcer. Auspitz's treatment was found most successful for these buboes at an early stage. A probe is passed in through a small opening and moved about in every direction, to break down the connective-tissue septa. After pressing out the blood and pus, a carbolized-oil compress was applied for twenty-four hours with a T-bandage. When a fluctuating abscess has formed, this treatment is useless, and large incisions are used.

2. The indolent bubo belongs to the indurated chancre. Boeck considers the induration to be primary, and the glandular tumefaction secondary. With regard to Sigmund's progressive indolent swelling of the entire glandular system in the syphilitic, Boeck remarks that he has seen the nearest group but little developed, and the remoter ones more or less developed, and that it is by no means seldom that one searches in vain for the cervical glands, and that the cubital glands are still more frequently wanting.

CONSTITUTIONAL SYPHILIS.

1. *The Acquired Form.*—Constitutional acquired syphilis is always developed from a chancre. This assertion, which has been denied, is defended by Boeck. He maintains that the induration belongs to the primary syphilis, and is not a secondary symptom. If it were the result of the action of the poison on the entire mass of the blood, it would be difficult to explain why it is only found at the spot which has been in contact with the poison. The chancre is the result of infection from primary or constitutional cases, and, whether conveyed by coitus, kissing, the use of the same spoon, pipe, etc., is due to a moist lesion. Communication by the breath or perspiration Boeck does not believe to be possible; the same is true of the saliva, unless there are lesions in the mouth which furnish pus-cells. He does not believe in the communication by the milk or the semen of syphilitic persons. No case of communication of syphilis by vaccination was observed, and several vaccinations were made with matter obtained from children affected with hereditary syphilis without any result other than the production of vaccine pustules. The cause of the different malignity manifested by the disease in different persons is due in part to constitutional differences, in part to a varying intensity of the virus. The author considers that there are but two periods in syphilis, that of the local appearance of the disease, and that in which constitutional symptoms are manifested. The expressions "secondary" and "tertiary" are but partially correct. Those lesions which, according to their anatomical character, should

belong to the tertiary period, may often occur at a very early stage of the disease. Boeck has seen but one well-defined case where syphilis was acquired more than once. The patient was treated for the disease when one year of age, and again contracted a chancre, with subsequent manifestations of constitutional syphilis, at eighteen years of age.

The prognosis of constitutional acquired syphilis is always uncertain; amyloid degeneration of the internal organs, brain-diseases, and paralysis, are by no means rare, and the duration of life is decidedly less in the syphilitic than in the non-syphilitic. Children and old people rarely have a grave form of the acquired disease. The most malignant forms are generally acquired at an age varying from twenty to thirty years.

2. The hereditary form is due almost exclusively to the mother. It varies exceedingly in degree, and this variation is dependent especially on the period which has elapsed since her infection, and how long before or after puberty it occurred. Boeck does not remember to have seen hereditary syphilis occur after the fifth month, and only once at so late a period. The prognoses of the hereditary and acquired form are infinitely different, and yet both forms are produced by the same virus; being introduced in the one case through the skin or mucous membrane, in the other through the mother's blood.

TREATMENT OF CONSTITUTIONAL SYPHILIS.

1. *The Acquired Form.*—*Mercury.*—Boeck was a mercurialist up to 1852. He was induced to abandon this remedy by the experience of many years that syphilis was only apparently cured by it, and that the internal organs were frequently attacked during its use. According to his statistics, 33 per cent. of those treated with mercury had a relapse; but many had several relapses, so that there were 1,672 relapses among 3,081 patients. He does not regard relapses as being of themselves great misfortunes, so long as they are confined to the skin and mucous membranes; on the contrary, he considers that Nature endeavors to retain the disease in those localities, while it is passing through its various stages. He was mainly induced to abandon mercury by the observation that, when

this remedy was used in syphilis, it exerted a destructive effect on the organism, attacked the viscera, and shortened the duration of life. He thinks he has strong grounds for this view in the statistics he has furnished concerning the later lesions.

Iodide of Potash.—This remedy passes with extreme rapidity into the blood, but disappears again with equal rapidity. Hence its rapid effect on the syphilitic manifestations; but, as soon as the remedy has passed out of the blood, the disease at once manifests itself again. The percentage of relapses is very large. Of 41 treated with this remedy, 21 had a relapse, or 51 per cent. He thinks, therefore, that it should not be used in the earlier periods. In the tertiary forms, especially where mercury has been used, it is useful. He never uses large doses, and, where the phenomena do not disappear after the use of 20 to 30 grammes, he pauses for several weeks before recommencing.

Syphilization.—The immunity constantly obtained by continued inoculation of the same individual with syphilitic virus is, according to Boeck, a fact of the first rank in natural history, which presents a glimpse in the chapter of contagion, and deserves to be placed by the side of vaccination. The immunity is acquired by the use of matter from the soft or hard chancre, though the latter is preferable, and, as has been shown above, by repeated inoculations this variety of ulcer can be made to take. The soft chancre is, according to Boeck, more intense in its action, and is, therefore, not absorbed until it has been so far weakened by repeated inoculations as to no longer produce demarkations, either in the immediate vicinity or in the adjacent glands. Syphilization consequently requires a longer time with the latter virus than with that from the indurated chancre. The action of syphilization is to be regarded as the absorption of the virus, and not as the quantity of ulceration produced. Boeck considers that syphilization assists Nature in passing with greater certainty and rapidity through the circle which syphilis has to accomplish before it arrives at a latent period. When Nature is left to itself, it often pauses half-way; but, assisted by again and again repeated inoculations, it passes in most cases throughout the entire circle. According to his statistics, syphilization gives

very good results. In Hjort's and Boeck's services at the National Hospital only 16 had relapses, and, including those treated at the Town Hospital, the percentage of relapses is 21. In only one to two per cent. was it necessary to have recourse to other remedies, iodide of potash or sarsaparilla, to cause the symptoms to disappear.

Derivation.—This method of treatment consists in the use of tartar-emetic plaster, changing the location between the back and the extremities. The percentage of relapses was 24, and in 14 per cent. it was necessary to have recourse to other remedies, mercury, iodide of potash, sarsaparilla, etc., in order to cause the symptoms to disappear. Boeck thinks it wrong to use specifics to prevent syphilis from passing through its regular stages. If it were possible, by using these remedies, to drive the disease out of the body, it would be another thing; but this is impossible; on the contrary, we run the risk of rendering the later relapses so much the worse.

The sweating-cure of Baerensprung has given worse results, in the hospitals, than any other method of treatment.

2. The hereditary form presents great variations. While some of these patients are incurable, in consequence of visceral disease, others have very mild forms, which are relatively easily cured. Mercury and syphilization have given the best results. The death percentage of the former was 45, and of the latter 46. At the age of from one to two months the mortality with mercury was 52 per cent.; with syphilization, 65 per cent. In the period between six and twelve months, with mercury, 29 per cent.; with syphilization, 11 per cent. Iodide of potash, partly direct, partly in the mother's milk, gave a death percentage of 72.

ART. II.—*Pompholyx* [*Cheiro-Pompholyx* (Hutchinson): *Dysidrosis* (Tilbury Fox)]. *A Study in this Disease, with Special Reference to its Nature and Pathological Histology.* By A. R. ROBINSON, M. D., L. R. C. P. and S., Edin. New York: G. P. Putnam's Sons, 1877.

DR. ROBINSON, in his little monograph of seventeen pages, has done a very excellent piece of work, of the kind that is

now much needed in this country among our dermatologists. Having had the rare opportunity of securing portions of tissue from a patient under his charge, he has been enabled to give us the histological as well as clinical history of the disease; and if his microscopical work has been accurate—of which there seems to be hardly a reasonable doubt—he has succeeded in showing that Dr. Fox's view of the seat of the trouble is erroneous. By a series of five most beautiful woodcuts from original drawings, Dr. Robinson appears to show conclusively that the vesicles which mark the disease are located in the papillæ, and that the fluid has the reaction of blood-serum.

As Dr. Tilbury Fox called it *dysidrosis*, referring the trouble to the sweat-glands, believing the liquid to be sweat, this term is very properly rejected, as also Dr. Hutchinson's cheiro-pompholyx, since it is not the hands merely, but often the feet, that are involved. It is to be hoped that Dr. Robinson will continue to prosecute his labors as successfully in other branches of his field.

BOOKS AND PAMPHLETS RECEIVED.—Lectures on Practical Surgery. By H. H. Toland, M. D., Professor of the Principles and Practice of Surgery and Clinical Surgery in the Medical Department of the University of California. With numerous illustrations. Philadelphia: Lindsay & Blackiston, 1877.

Cyclopædia of the Practice of Medicine. Edited by Dr. H. von Ziemssen, Professor of Clinical Medicine in Munich, Bavaria. Vol. XVI. Diseases of the Locomotive Apparatus, and General Anomalies of Nutrition. By Prof. H. Senator, of Berlin, Prof. E. Seitz, of Giessen, Prof. H. Immermann, of Basel, and Dr. Birch-Hirschfeld, of Dresden. Translated by E. B. Baxter, M. D., of London, John Todhunter, M. D., of Dublin, Godfrey Acquer, M. D., and Frank P. Foster, M. D., of New York, and Henry P. Bowditch, M. D., of Boston. Albert H. Buck, M. D., New York, Editor of American edition. New York: William Wood & Co., 1877.

The Ear: its Anatomy, Physiology, and Diseases. A Practical Treatise for the Use of Medical Students and Practitioners. By Charles H. Burnett, A. M., M. D., Aural Surgeon to the Presbyterian Hospital; Surgeon in Charge of the Infirmary for Diseases of the Ear, Philadelphia. With Eighty-seven Illustrations. Philadelphia: Henry C. Lea, 1877.

On the Various Forms of Pruritus Cutaneus, and their Treatment. By R. W. Taylor, M. D., Professor of Diseases of the Skin in the Univer-

sity of Vermont; Physician to Charity Hospital, N. Y. Read before the Burlington Medical and Surgical Club, at Winooski, Vermont, May 14, 1877. Reprinted from the *Archives of Clinical Surgery*, August, 1877.

Practical Hints on the Selection and Use of the Microscope. Intended for Beginners. By John Phin, Editor of the *American Journal of Microscopy*. Second edition, fully illustrated and greatly enlarged. New York: Industrial Publication Co., 1877. Pp. 181.

An Index of Diseases and their Treatment. By Thomas Hawker Tanner, M. D., F. L. S. Second edition, revised by W. H. Broadbent, M. D., Fellow of the Royal College of Physicians, etc. Philadelphia: Lindsay & Blakiston, 1877.

Defects of Hearing, and Other Evils, the Result of Enlarged or Hypertrophied Tonsils. By A. W. Calhoun, M. D., Professor of Diseases of the Eye and Ear, and Clinical Ophthalmology and Otology, in the Atlanta Medical College.

Public Health Reports and Papers. Vol. III. Presented at the Meetings of the American Public Health Association in the Years 1875-'76. With an Abstract of the Record of Proceedings, 1876. New York: Hurd & Houghton, 1877.

The Abuse and Use of Bromides. By E. C. Seguin, M. D., Clinical Professor of Diseases of the Mind and Nervous System in the College of Physicians and Surgeons, New York. Reprinted from the *Journal of Nervous and Mental Disease*, July, 1877.

Lectures on Fevers. By Alfred L. Loomis, A. M., M. D., Professor of Pathology and Practical Medicine in the Medical Department of the University of the City of New York; Consulting Physician to the Charity Hospital, etc., etc. New York: William Wood & Co., 1877.

A Treatise on the Pathology of the Urine, including a Complete Guide to its Analysis. By J. L. W. Thudichum, M. D. Second edition. Philadelphia: Lindsay & Blakiston, 1877.

Transactions of the Medical Association of Georgia, Twenty-eighth Session, 1877.

Transactions of the Medical Society of North Carolina, 1877.

Reports on the Progress of Medicine.

CONTRIBUTED BY DR. GEORGE R. CUTTER.

SURGERY.

Suppuration of the Ascending Vena Cava without Metastatic Abscesses.—In puerperal diseases the suppuration is ordinarily limited to the

external veins, and is habitually complicated with suppurative peritonitis, with metastatic abscess, or consecutive embolism.

The case reported by Dr. Z. Mazzotti, Prosecutor of the University of Boulogne, is extraordinary for the reason that, without suppuration of the external veins, without consecutive production of multiple abscesses, the pus was found in the *vena cava*. It is now known that thrombosis may precede suppuration, but, in the one case as in the other, suppuration may take place. It is true that Virchow believed that, in inflammation and suppuration consecutive to thrombosis, the suppuration was nothing but a simply puriform softening, and not purulent; it is, nevertheless, proved that pus may often be formed in the veins. It is strange, however, that a vessel so large as the *vena cava* could be the seat of suppuration. For this reason Mazzotti reports this case minutely. It is that of a woman who aborted at the fifth month, and succumbed more than a month later to a violent infectious fever, accompanied by convulsions at the last moments.

At the autopsy the remarkable peculiarity was found of a stratified thrombus, with intercalated white globules, in the right femoral vein. The white globules adhered to the internal parietes. Then, the *vena cava* presented in its interior accumulated pus and *débris* of thrombus. There was a proliferation of the *tunica interna*; the small vessels were filled with leucocytes, some of which were migratory. The thrombus was formed by concentric strata. There was neither suppuration of the uterine veins, suppurative peritonitis, nor embolic nor metastatic abscess.—*Journal des Sciences Méd. de Louvain*, August, 1877. G. R. C.

Cardiac and Pulmonary Paralysis from Occlusion of a Coronary Artery.—Dr. Galignani reports the case of a man, sixty-four years of age, who had always enjoyed very good health, who suddenly became unwell and had abundant cold sweats. After taking a little magnesia he felt well enough to leave his bed. An hour later was reattacked by the same trouble; he was cold, pallid, almost pulseless, and suffocating. The doctor prescribed a stimulating mixture, but without benefit. Four hours later the patient was cold, the physiognomy changed; respiration 36, and pulse 56; the cardiac pulsations could neither be seen nor felt; the cardiac area was diminished on percussion; on auscultation, the tones were weak, but distinct in sound. He was bled to the extent of two hundred grammes, after which the pulse rose, but without diminution of the suffocation. Three hours later the man died.

On *post-mortem* examination, atrophy and adipose degeneration of the miocardium were found, with and from atheromatous ossification of the coronary arteries. Death was suddenly caused by embolism of the left anterior coronary, following the detachment of a fragment of the atheromatous concretion of the aortic sinus of Valsalva.

The good health enjoyed by this man, notwithstanding the ossification of the coronaries, was regarded by Galignani as due to the regular and tranquil life he led. The elevation of the pulse he believes was due more to the removal than to the transmission of a sanguineous wave, repeated by the incomplete cardiac systole facilitated by the bleeding. It is not denied, however, that the pulse may have become elevated independently of the bleeding.—*Annali Univ. di Med.*, and *Gazz. Med. Ital. Lombardia*, August, 1877. G. R. C.

Paronychia of the Thumb.—According to M. Verneuil, the incision should in general only be made in the median line. The lateral incisions not only endanger the section of the arteries and nerves with its consequences, but they rarely relieve the suffering. Incisions in the median line should therefore always be preferred, for the double reason that they do not lead to any accident and are much more efficacious.—*Journal des Sciences Méd. de Louvain*, August, 1877. G. R. C.

Evacuation of Pus from the Pleura by Inversion of the Body.—Dr. Raynaud has tried with success the following method: A girl, fifteen years of age, convalescing from typhoid fever, contracted a purulent pleurisy, and after a time there was pulmonary perforation followed by a considerable vomica. The expectoration was insufficient to empty the liquid contained in the pleura, and in consequence the general condition became constantly worse. Dr. Raynaud then placed the child with her head below the border of the bed, and this manœuvre was followed by an abundant expectoration. This process, repeated several times, emptied the pleura of its purulent contents, and the child rapidly recovered its strength and was soon quite well.—*Giorn. Ven. di Sc. Med.*, and *Gazz. Med. Ital. Venete*, August, 1877. G. R. C.

Coagulation of Pus by freezing the Skin over Superficial Abscesses.—M. Obissier, of Bordeaux, states that, on attempting to empty an abscess with the aspirator under local anæsthesia with ether, the operation was arrested by the plugging of the canula with a fatty cylinder. He believed the latter to have been coagulated pus, because two hours later, without anæsthesia, he was able to extract 200 grammes of pus.—*L'Inparziule*, and *Gazz. Med. Ital. Venete*, August, 1877. G. R. C.

Chelotomy with General and Local Anæsthesia.—Dr. G. Alfara, in operating for hernia, desired to spare his patient as much as possible from pain. He gave chloroform, and made two hypodermic injections of sulphate of morphine over the region of the tumor; each injection contained two centigrammes. After the operation he moistened the wound with a solution of morphine, to prolong the anæsthesia. The patient scarcely felt the pain of the first incision, and was slightly conscious of the suture. This case is reported to show the advantage which may be obtained from local and general anæsthesia.—*Journal des Sciences Méd. de Louvain*, August, 1877. G. R. C.

THEORY AND PRACTICE.

Electricity for Sleeplessness.—That galvanization of the head has an hypnotic effect, has long been known; hitherto, however, it has not been used to counteract sleeplessness. Vigoureux asserts (*Allg. Wiener Med. Ztg.*) that he has daily obtained the finest results in this direction, and has failed only in exceptional cases, as, for instance, when sleep has been disturbed or prevented by severe dyspnœa. His method is, to place the broad flat electrodes (carbon covered with chamois-leather) on both temples, and allow the current of from three to at the most five Trouve's elements to pass for a half or a whole minute. When the application is made in the morning, the patient experiences a more or less pronounced inclination to sleep. Occasionally the effect of the galvanization is prolonged after the first night, for a night or two.—*Memorabilien*, No. 7, 1877. G. R. C.

Benzoate of Lithium in Gout.—The benzoate is superior to all the other preparations of lithium in the treatment of the uric-acid diathesis. It is readily soluble in water, and the benzoic acid, by its transformation into the nitrogenous hippuric acid, counteracts the secretion of the uric acid. Instead of the rather insoluble urates, which are generally regarded as the cause of the gouty affection, appear the readily soluble hippuric alkalies and earths, which are excreted from the organism with the urine. The truth of the above propositions has been proved by experience. With the continued use of the benzoate of lithium the attacks of gout become more

rare and milder, and the pains in the bones cease.—*Rev. de Thérap.* and *Memorabilien*, No. 6, 1877. G. R. C.

Three Cases of Acute Articular Rheumatism cured by Subcutaneous Injections of Cold Water.—Since 1869, when Potain made known the results of his experiments with the subcutaneous injections of water, others have been made, and several cases of acute articular rheumatism thus cured have been published in the *Gazz. Med. Prov. Venete*. Dieulafoy has also been able to verify the prompt efficacy of this treatment. Dr. Liron also publishes (*Gaz. Méd. de Paris*, August, 1877) three similar cases. The improvement was rapid in all three of them; two or three injections in the vicinity of the diseased articulations sufficed in two of these cases to cause the pain to cease and to restore motion. In the third case a greater number of injections were necessary to obtain a cure, there having been a tendency of the affection to generalize itself; this also showed that this therapeutic measure was not only able to effectually combat the pain, but also to cure the disease. Undoubtedly, a few isolated cases do not suffice to establish the therapeutic virtues of this method; but Dr. Liron thinks the successes obtained by himself and others suffice to call the attention of physicians to a procedure which, from the promptness of the results and its simplicity, may be a valuable resource.—*Gazz. Med. Ital. Venete*, August, 1877. G. R. C.

Miscellany.

The New Hotel Dieu.—The report of the *Lancet* commission on the new Paris hospital is given in the issue of September 15. Notwithstanding the magnificence of the building, which has already cost about seven and a half million dollars, the commission finds much to criticise. The water-closets are said to be ill-arranged and badly ventilated, the bath-rooms and washing-places defective, and the servants' apartments remarkable for the general neglect of hygienic principles shown in their construction. Worst of all is the fact that the furniture of the old building has been removed into the new. Mattresses, tables, chairs, bedside pedestals, etc., certainly carry with them many of the very dangers the new hospital is designed to avoid. On the other hand, many of the appointments are even extravagantly elegant and luxurious, and ample provision has been made for the recreation of convalescent patients.

A Lady Practitioner in Disguise.—A Dr. James Barry served as surgeon in the British Army for more than fifty years, dur-

ing which time he held many important medical offices, and gained an enviable reputation as a cool and skillful operator. He was of a very irritable temper, and, while stationed at the Cape of Good Hope, fought a duel. Notwithstanding frequent breaches of discipline, he attained high rank in the army, served in many parts of the world, and in 1865 his name stood at the head of the list of inspectors-general of hospitals. In July, 1865, the eccentric surgeon died, and the next day it was officially reported that the doctor was a woman. No suspicion of the surgeon's sex seems ever to have been entertained, even by his most intimate associates. In addition to his other accomplishments, Dr. Barry was an inveterate smoker.

Opening of the Colleges.—The introductory address to the winter course of lectures at the College of Physicians and Surgeons was delivered on Monday evening, October 1st, by Prof. John G. Curtis; subject, "Plant and Animal Life."

The introductory lecture of the regular course at the Medical Department of the University of the City of New York was delivered on Tuesday evening, October 2d, by Prof. William H. Thomson.

The opening exercises of the winter session at the Bellevue Hospital Medical College took place on Wednesday evening, October 3d. The address was delivered by Prof. William M. Polk.

Obstetric Mortality in Vienna.—A great improvement is reported in the midwifery service at Vienna. There are about ten thousand deliveries during the year. In the last two thousand there were only nineteen deaths, and in the last eight hundred only *two* deaths. The former great mortality in this clinic was due largely to the carelessness with which students passed to and fro between the dissecting-room and the lying-in wards. Precautions are now adopted, and washing the hands in carbolized water before attending obstetric cases is made imperative. The good result is evident.

Lectures by Dr. Brown-Sequard.—A course of eight lectures, on Paralysis and Convulsions as effects of Organic Dis-

ease of the Brain, will be given by Dr. Brown-Séquard at the Bellevue Hospital Medical College, according to the following dates: Friday, November 2d, 2½ o'clock; 3d, 3½ o'clock; 16th, 2½ o'clock; 17th, 3½ o'clock; 30th, 2½ o'clock; December 1st, 3½ o'clock; 14th, 2½ o'clock; 15th, 3½ o'clock. The lectures will be free, and the profession is invited to profit by the rare opportunity of listening to the distinguished savant.

Appointments, Honors, etc.—Dr. Matthews Duncan has accepted the office of Obstetric Physician to St. Bartholomew's Hospital, in place of Dr. Greenhalgh, and will settle in London. Dr. George H. B. MacLeod, M. D., has been appointed one of the Surgeons in Ordinary to her Majesty in Scotland, in place of Prof. Lister, resigned. Dr. William Stirling has been appointed to the Chair of Physiology in the University of Aberdeen.

The University of Pennsylvania.—The opening of the medical department of this university, under the new *régime*, took place October 1st, under the most favorable auspices, the number of students being nearly as large as last year. The introductory address was made by Prof. Wm. Pepper, and was on the subject of the higher education, in which that university has set an excellent example, the course of study being now lengthened to three years.

New York Obstetrical Society.—At the annual meeting of this Society, held October 16th, Dr. T. G. Thomas, President, in the chair, the following officers were elected for the ensuing year: President, Dr. A. J. C. Skene; Vice-Presidents, Drs. James S. Green and C. S. Ward; Secretary, Dr. M. D. Mann; Treasurer, Dr. G. S. Winston.

Journalistic Notes.—The *Hospital Gazette* and *Archives of Clinical Surgery* have been consolidated. The *New Orleans Medical and Surgical Journal* shows signs of prosperity by appearing as a monthly. Drs. W. H. Watkins and G. K. Pratt are joint editors with Dr. Bemiss.

Death from Chloroform.—The *Medical Times and Gazette* reports the death of a young man at the Radcliffe Infirmary, Oxford, while under the influence of chloroform, given for an operation on the foot.

Prof. Hamilton's Clinics.—During the months of November and December Dr. Frank H. Hamilton will hold his surgical clinic at Bellevue Hospital on Wednesdays, at 2.30 P. M.

Army Intelligence.

Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from September 14 to October 13 1877.

MCPARLIN, THOS., Major and Surgeon.—Relieved from duty in Department of the Missouri, and to return in person to the Surgeon-General. S. O. 193, A. G. O., September 12, 1877.

ALDEN, C. H., Major and Surgeon.—Relieved from duty in Department of the Columbia, to proceed to New York City, and on arrival report by letter to the Surgeon-General. S. O. 193, C. S., A. G. O.

STERNBERG, G. M., Major and Surgeon.—To proceed to Fort Walla-Walla, W. T., and resume his duties as Post-Surgeon. S. O. 139, C. S., Department of the Columbia.

McCLELLAN, ELY, Major and Surgeon.—Assigned to duty as Post-Surgeon at Fort Lapwai, Idaho T., relieving Surgeon Sternberg. S. O. 139, Department of the Columbia, September 26, 1877.

GREENLEAF, C. R., Major and Surgeon.—Assigned to duty as Post-Surgeon at the Post to be established at Helena, Mont. S. O. 136, Department of Dakota, October 8, 1877.

HAPPERSETT, J. C. G., Major and Surgeon.—Relieved from duty at Wilkesbarre, Pa., and to return temporarily to his proper station, Fort Hamilton, N. Y. H. S. O. 216, Division of the Atlantic, September 18, 1877.

WOODHULL, A. A., Major and Surgeon.—When relieved from duty at Camp Halleck, Nev., to proceed without delay to Alcatraz Island, Cal., and report for duty at that Post. S. O. 117, Division of Pacific and Department of California, September 21, 1877.

WATERS, W. E., Captain and Assistant Surgeon.—Relieved from duty at Mauch Chunk, Pa., and to return to his proper station, Fort Columbus, N. Y. H. S. O. 211, Division of the Atlantic, September 13, 1877.

DE GRAW, C. S., Captain and Assistant Surgeon.—Relieved from duty at Carlisle Barracks, Pa., to return to his proper station, Oglethorpe Barracks, Savannah, Ga., and there await further orders. S. O. 216, C. S., Division of the Atlantic.

BROOKE, JOHN, Captain and Assistant Surgeon.—Assigned to duty as Post-Surgeon at Camp Howard, near Mt. Idaho, relieving Assistant Surgeon Matthews. S. O. 139, C. S., Department of the Columbia.

GARDNER, W. H., Captain and Assistant Surgeon.—Relieved from duty at Allegheny Arsenal, Pittsburg, Pa., and assigned to duty at Atlanta, Ga. S. O. 232, Division of the Atlantic, October 6, 1877.

BENTLEY, E., Captain and Assistant Surgeon.—Relieved from duty at Scranton, Pa., and to return to his station, Little Rock Barracks, Ark. S. O. 209, Division of the Atlantic, September 11, 1877.

CRONKHITE, H. M., Captain and Assistant Surgeon.—Granted leave of absence for one month, with permission to apply for an extension of one month. S. O. 109, Department of Arizona, September 26, 1877.

KIMBALL, J. P., Captain and Assistant Surgeon.—Assigned to duty at Wilkesbarre, Pa. S. O. 216, C. S., Division of the Atlantic.

LORING, L. Y., Captain and Assistant Surgeon.—Granted leave of absence for one month from October 10, 1877, with permission to apply for five months' extension. S. O. 108, Department of Arizona, September 25, 1877.

ELBREY, F. W., Captain and Assistant Surgeon.—Assigned to duty as Post-Surgeon at the temporary camp to be established at or near Spokane Falls, W. T. S. O. 139, C. S., Department of the Columbia.

MATTHEWS, W., Captain and Assistant Surgeon.—To accompany Companies B and F, Twelfth Infantry, to Department of California. S. O. 138, Department of the Columbia, September 25, 1877.

DICKSON, J. M., Captain and Assistant Surgeon.—To proceed to Jackson Barracks, La., close his accounts at that Post, and return with the least delay practicable to his Post, Indianapolis, Ind. S. O. 216, C. S., Division of the Atlantic.

EWEN, C., Captain and Assistant Surgeon.—Relieved from duty at Easton, Pa., and assigned to duty with United States troops at Scranton, Pa. S. O. 216, C. S., Division of the Atlantic.

AINSWORTH, F. C., First Lieutenant and Assistant Surgeon.—When relieved by Assistant-Surgeon Worthington, assigned to duty at Fort Whipple, A. T. S. O. 108, C. S., Department of Arizona.

MOSELEY, E. B., First Lieutenant and Assistant Surgeon.—Assigned to duty at Jackson Barracks, La. S. O. 147, Department of the Gulf, September 20, 1877.

SKINNER, J. O., First Lieutenant and Assistant Surgeon.—Assigned to temporary duty at Carlisle Barracks, Pa. S. O. 216, C. S., Division of the Atlantic.

WORTHINGTON, J. C., First Lieutenant and Assistant Surgeon.—Relieved from duty at Fort Whipple, A. T., and assigned to duty as Post-Surgeon at Camp Grant, A. T. S. O. 108, C. S., Department of Arizona.

CRAMPTON, L. W., First Lieutenant and Assistant Surgeon.—Assigned to duty at Jackson Barracks, La. S. O. 146, C. S., Department of the Gulf.

TAYLOR, M. E., First Lieutenant and Assistant Surgeon.—Reassigned to duty at Baton Rouge Barracks, La. S. O. 148, Department of the Gulf, September 21, 1877.

ROBINSON, S. Q., First Lieutenant and Assistant Surgeon.—Assigned to duty as Post-Surgeon at the Post near Missoula, Montana. S. O. 136, C. S., Department of Dakota.

DAVIS, WM. B., First Lieutenant and Assistant Surgeon.—Assigned to duty at Fort A. Lincoln, D. T. S. O. 130, Department of Dakota, September 26, 1877.

Obituary.

PROF. GERLACH, Director of the Royal Veterinary College at Berlin, and one of the authorities on veterinary medicine, died on the 29th of August last.

CHARLES MAYO, M. A. and M. D., Oxon., died at sea near the Feejee Islands, July 15, 1877, aged forty years. Dr. Mayo had seen much foreign medical service, and was especially active in the organization of hospitals on the German side during the Franco-Prussian war. During the American war he served for some time as medical officer in the Thirteenth Corps, at Vicksburg. In 1873 he served with the Dutch at Acheen, and endured much hardship and exposure. On the cession of the Feejee Islands to the English, he entered the Government service in that country, and died on board ship of acute dysentery, contracted amid the discomforts and privations of service on a solitary island.

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Original Communications.

ART. I.—*On the Antiseptic Treatment of Wounds, and its Results.*¹ By ROBERT F. WEIR, M. D., Surgeon to the New York and Roosevelt Hospitals.

It is only lately that, in America, attention has been given practically to the teachings of Lister in respect to the treatment of wounds. In fact, aside from an article by Schuppert in the *New Orleans Medical and Surgical Journal*, little or nothing has appeared in our medical journals relative to the results of the so-called antiseptic method. Within the past year, however, a change has occurred, due probably both to the interest excited by the personal expositions of Lister at our late Medical Congress at Philadelphia, and also to the satisfactory results that have ensued from this treatment in the practice of many German surgeons with large hospital experience. The reason why American surgeons—who justly have the reputation of being eager to seize upon any improvement in their art—have been tardy in testing the success of this mode of treatment, may, perhaps, be stated as follows: 1. That the treatment, as enunciated by Mr. Lister, has been

¹ Read before the New York County Medical Society at their meeting held, November 26, 1877.

repeatedly changed in its details; 2. That it was too complicated, and demanded the supervision of the surgeon himself, or, in a hospital, of a carefully-trained staff of assistants; 3. That many who had tried it had been unsuccessful in the cases where the essay had been made. But the most weighty objection which was asserted or entertained, was the positiveness of the enunciation of the germ-theory in explanation of the process of decomposition in the secretions of a wound. Only the latter reason requires any attention at present, and, as a clearer conception of the intent of the many *minutiæ* of the dressing may come from a synopsis of this theory, it will be succinctly given, notwithstanding the purpose of this evening's paper is to present the subject as far as possible from a clinical point of view.

It is, in a few words, this: 1. That in the dust of the atmosphere, and in matter with which it is in contact, there are the germs of minute organisms, which under favorable circumstances induce putrefaction in fluids and solids capable of that change, in the same manner as the yeast-plant occasions the alcoholic fermentation in a saccharine solution; 2. That putrefaction is not occasioned by the chemical action of oxygen or other gas, but by the fermentative agency of these organisms; 3. That the vitality or potency of the germs can be destroyed by heat or by various chemical substances, which are called, in surgery, "antiseptics."¹ The very definition of the "antiseptic system," as given in the words of Lister himself, is "the dealing with surgical cases in such a way as to prevent the introduction of putrefactive influences into wounds."² Nothing need here be added to these statements, in their verification or otherwise (though analogy and accumulating facts seem to lend support to them), except that from the standpoint adopted two important statements need to be referred to. I mean those of Thompson,³ Weitzelbaum,⁴ and others, that they had found living bacteria in

¹ T. Smith, *Lancet*, March 25, 1876.

² "Transactions of the International Medical Congress," Philadelphia, 1876.

³ *Medical Times and Gazette*, November 6, 1875.

⁴ *Wiener Med. Presse*, 1876, Nos. 10 and 11.

the carbolic solutions as used by Lister, and of Linhart,¹ Fischer,² Ranke,³ Schüller,⁴ and Volkmann,⁵ who, in several hundred observations, have found bacteria in the discharges of wounds that had been most carefully and satisfactorily treated by the antiseptic method. It was noticed, however, that the presence or absence of these bacteria (and such were only considered as present when chain-bacteria were found) did not influence the progress of the wounds; and Fischer gives the opinion, in which many of his countrymen join, that the object of the dressing is not so much to keep the germs away as to keep the secretions in such a condition as to be as unfavorable as possible to the development of bacteria, and thus prevent decomposition taking place.

It is only justice to append the remarks of Mr. Lister at the Congress in respect to these observations, or rather, correctly speaking, of Ranke's. They are, textually: "The statement that cell forms have been found beneath antiseptic dressings must be received with caution. I have," continues he, "recently met a gentleman who was with Ranke in Halle when he found, as he supposed, these organisms beneath antiseptic coverings; and when the gentleman pointed out to me the bacteria which he called putrefactive, I at once recognized them as of the non-putrefactive variety, and the gentleman was forced to admit that they differed from those found in decomposing masses."*

Passing from these facts (?) of the laboratory, let us consider those to be used and acquired at the bedside. In practicing this method, in order to form a proper judgment of its merits, it is essential that Mr. Lister's plan should be thoroughly known, and be carried out even to its minutest particular. The chorus on this point is unanimous among surgeons who have successfully used it. Hagedorn, of Magdeburg, says that in every failure the surgeon himself is to

¹ Schmidt's "Jahrbücher," vol. 174, 4.

² *Deut. Zeitschr. f. Chirurg.*, vol. vi., p. 319.

³ *Idem*, vol. vi., p. 63.

⁴ *Idem*, vol. vii., 1876, pp. 5, 6.

⁵ Schmidt's "Jahrbücher," vol. 174, 2, 1877.

* "Transactions of the International Congress," 1875, p. 540.

blame, and not the method; and Lindpaintner,¹ representing the experience of Munich with nearly a thousand cases treated antiseptically, states that it must be considered a precept that the minutest directions must be followed, and that he who does not get the result (desired) must certainly have made some mistake. This opinion is reiterated by all who have achieved success by the method, and the number of such is already large and increasing.² A second condition, which really should have come first, is that they who use the method should at least provisionally accept the theory on which the dressing is based; they should, so to speak, act as if they saw germs on everything. This, however, is not so imperative as the one just spoken of.

“For,” remarks Lister, “those who are unwilling to accept the theory in its entirety, and choose to assume that the septic material is not of the nature of living organisms, but a so-called chemical ferment destitute of vitality, yet endowed with the power of self-multiplication. . . . such a notion, unwarranted though I believe it to be by any scientific evidence, will, in a practical point of view, be equivalent to the germ-theory, since it will inculcate precisely the same methods of antiseptic management. It is important that this should be clearly understood.”

For the proper application of the antiseptic dressings to any wound made by a surgeon, the following things are necessary:

1. *Three Solutions of Carbolic Acid*, duly labeled: (a) 1 to 40 for the “protective,” and for the “loose layer of gauze.” (b) 1 to 30 for the spray. It is intended that the spray itself should be of the strength of 1 to 40; by using, however, this second solution of 1 part to 30, it will be found that the dilution accomplished by the steam will bring it down to the desired strength. However, this is a matter that should be tested by each surgeon for himself.³ (c) A 1 to 20 solution, in

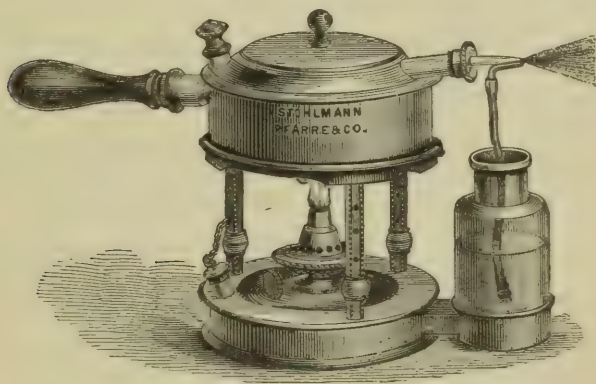
¹ *Deut. Zeitschr. f. Chirurg.*, vol. vii., p. 18.

² See Schmidt's *Jahrbücher*, vol. 172, 4, and Hirsch's *Jahresbericht*, 1877, for an interesting summary of the antiseptic treatment.

³ For instance, in converting 19 ounces of water into steam, 57 ounces of carbolic solution, of 1 to 30, were used by my present atomizer, giving for the spray exactly the strength of 1 to 40.

which the sponges,¹ instruments (the latter for half an hour to "Listerize," as Volkmann says, the joints and the teeth of forceps, etc.), and the drainage-tubes are immersed. This solution is also used to wash the epidermis² adjacent to the proposed wound, the hands, and particularly the finger-ends, of the surgeon.³ With the same solution injections are made into compound fractures, or wounds that have been exposed some time to the air; although, for the former, Mr. Lister has lately used a solution of 1 part acid to 5 of spirits of wine, employed in a manner to be alluded to shortly.

2. *A Steam-spray Apparatus.* The best is that devised by Lister himself. It is, however, quite costly, ranging in price from fifty to seventy-five dollars, and it was to meet this objection that the one before you has been constructed. With



its diminished cost some of the improvements of Mr. Lister's lamp have been sacrificed. It is, however, essentially the

¹ Sponges when not in use should, after being washed out thoroughly, be kept constantly in a 1 to 20 solution of carbolic acid.

² On the Continent the use of soap and water with a nail-brush, and a subsequent washing with ether, are advised prior to using the carbolic-acid solution. This appears to be an unnecessary addition to the already great complexity of detail.

³ To avoid some of the irritating and roughening effects of the acid, it is of service to anoint the hands with carbolic oil, 1 to 10, before exposing them to the spray.

same. Its hollow wick, readily raised or lowered, affords a great and controllable heat. The spray-tube is in this apparatus fixed, an objection which in the majority of cases is of no moment. It will supply spray for over two hours. It therefore requires only that the boiler—containing twenty-two ounces—should be, as well as the lamp, full at the beginning of the operation; and, with this precaution, it has been found practicable to dispense with the expensive and tell-tale windows of glass belonging to the original imported instrument.¹ The accompanying wood-cut gives a good representation of this lamp.

3. *Antiseptic Gauze.* This is made of a coarse-meshed cotton cloth (26 to 30 threads to the linear inch) called “mull” in Great Britain, but known here as cheese or dairy cloth. This cloth is heated beyond 212° , then sprinkled with its own weight of a mixture of carbolic acid 1 part, common resin 5 parts, and paraffin 7 parts, prepared by mixing together the two latter in a water-bath, and then adding the acid by stirring. The impregnated cloth is afterward kept under pressure in a water-bath box for an hour or two to disseminate equally the liquid, when the material is fit for use.² The resin, it is well known, gives off the acid very slowly—that is what is wished for—but it would leave the gauze too sticky were not the paraffin joined to it. Made in this way, it costs, in the Edinburgh Infirmary, unprepared, $1\frac{1}{2}$ d. a yard, and prepared, 2d. a yard.

The material from which I have had it made at the Roosevelt Hospital costs $3\frac{1}{2}$ cents per yard, 28 inches wide, at wholesale, and is obtained from H. B. Claflin & Co., and when prepared, 6 cents per yard. It is in its preparation, however, managed a little differently; for the heated cloth is immersed in the melted material by passing under rods near the bottom of the hot box containing the mixture, and, before emerging from this box, passing between two confronting rubber strips (in fact, weather-strips), which removes the surplus of the mixture; it is then caught on a roller, on which are passed at the same time, from another roller imme-

¹ The modified apparatus is furnished in a portable case by Stohlmann Farrer & Co., 67 Chatham Street, at the moderate price of fifteen dollars.

² *Lancet*, March 13, 1875.

diately below it, 3 to 5 layers of heated unprepared cloth. This tight roll of immersed and dry cloth has sufficient heat in it to cause the proper dissemination of the mixture through all the layers before it cools. Only occasionally is it found necessary to place the roll for further heating in a hot-air chamber. The impregnating layer is sometimes found a little too stiff, and is used in the manufacture of bandages. By this procedure three hundred and fifty yards of prepared gauze can be manufactured at once in a much less space of time than by the other procedure. Details of the preparation of this and other materials are dwelt upon because mistakes are continually occurring; as confirmatory of this, it is necessary only to remark that a firm concerned in manufacturing the gauze in this city has failed, until recently, to appreciate the necessity of previously heating the cloth to insure the thorough penetration of the mixture into its substance, with the result of the central fibres being found imperfectly charged from neglect of this precaution.

4. *The Mackintosh*—a thin cotton-cloth with a layer of red vulcanized rubber on one side, and known frequently as hat-lining used as a “sweat proof,” or thinnest mackintosh, a name derived from the manufacturers in Manchester, England. Other rubber-cloth or gutta-percha tissue will answer, but whatever is used must be impermeable, and should be held up to the light for the detection of holes, etc., before each dressing.

5. *Black rubber tubing*, varying in size from that of a small quill to that of the little finger, with numerous openings on the side, each half the diameter of the tube. These are for drainage. One or more are inserted, according to the size and depth of the wound and the number of its pockets. It is better to use two small ones in any given spot than one large one, as they will not separate the edges so much. To the outer end of these—cut square or beveling, as it may be required, to make them lie flush with the skin—are attached silk threads to secure them; or they can be prevented slipping inward by thrusting, as Volkmann does,¹ a fine cambric needle

¹ “*Samml. klin. Vorträge*,” Nos. 117, 118.

across the distal end. A number of threads of catgut are sometimes used in lieu of the tube, or in addition to it, so that the former can be withdrawn at any desired time, and the catgut left *in situ*.

6. *The Protective*, technically so called. This is ordinary oiled silk, coated on each side by a thin layer of copal varnish, to render it impermeable to carbolic acid (which gutta-percha tissue is not), and then brushed over with a mixture of dextrine 1 part, starch 2 parts, and 16 parts of a 1 to 20 carbolic-acid solution. This coating causes the disinfecting solution to adhere smoothly to the protective, when it is immersed in it prior to an operation. The function of this is not an antiseptic one; it is really to protect the wound itself from the irritating effects of the carbolic acid stored up in the antiseptic gauze.

7. *Carbolized Catgut Ligatures*, made by putting catgut (or silk-worm gut—Bardeleben)¹ into a mixture of carbolic acid 1 part, which is dissolved in one-tenth its weight of water, and then added to 5 parts of olive-oil. Do not mix the acid and oil together, and then add water; it spoils the catgut. The ligatures should remain in this mixture at least two months, and the longer they are kept in the solution the better they are said to be.² Though, when thus made, they generally answer their purpose, yet, as they have at times acted as foreign bodies, and provoked irritation, Mr. Lister has endeavored to improve upon this mode of preparation; and, at the International Medical Congress held at Philadelphia last year, he announced that he had made more satisfactory ligatures by a mixture of carbolic acid, glycerine, chromic acid, spirits of wine, and water; the exact formula has not, however, yet been given to the public. In this connection it is proper to allude to the painstaking endeavors toward perfection that have continually prompted the eminent promulgator of the antiseptic dressing; his persistent labors are attested by the many changes, always for the better, that have marked the

¹ Hirsch's "Jahresbericht," 1870, p. 322.

² Some marbles or pebbles, covered by a piece of glass, are put in the bottom of the bottle, to prevent the gut from touching the water that collects there.

progress of his treatment of wounds. These improvements, I regret to say, have been misinterpreted by many, as indications of unreliability, but they have all been steadily directed to the accomplishment of the end in view.

8. *Carbolized Silk Sutures*, made by plunging ordinary surgeon's silk into melted wax 10 parts, and 1 part carbolic acid. After being withdrawn, the surplus wax is removed by drawing the silk through a folded cloth. If there is not much tension in the part, catgut is often used for sutures.

Having made these preparations, as follows, and the directions relative to the instruments, sponges, hands, and the adjacent skin, having been properly complied with, and the surface of the body not too much exposed, the operation or incision is begun by directing the spray, made as fine as possible,¹ upon or a little above the intended wound. The management of this is one of the most important duties to be intrusted to an assistant. Currents of air may turn away the cloud of spray, the position of the limb may be changed, the surgeon may unexpectedly place himself or his hands in the way, and thus screen the wound, etc.: all these difficulties must be looked after by the attentive lampholder.² The incision having been made, all bleeding points must be secured by the catgut ligatures, both ends of which are to be cut off short; generally an ordinary reef-knot will secure the ligature properly; if you are in doubt, you may add a third one.³ The wound is then to be closed accurately with the carbolized silk or gut sutures,⁴ and a drainage-tube or tubes placed in the

¹ By contracting or partially plugging the delivery-tube—i. e., the one immersed in the carbolized solution—the spray is rendered finer.

² It is well to have an extra spraying apparatus accessible. Richardson's will answer. If the spray should suddenly cease, the wound should be at once covered with several layers of gauze wet with 1 to 40 solution, called sometimes the "guard."

³ This is particularly advisable when ligating a vessel in its continuity.

⁴ Should any traction be required to approximate the lips of the wound, a deep relaxation-suture is to be resorted to, and held *in situ* by perforated disks of lead—a procedure similar to that used by Dr. Gurdon Buck, of this city, some ten years since, in plastic operations on the face. Adhesive straps, if used, should be short enough to be overlapped by the gauze dressing, and should previously be dipped in a hot carbolic solution of 1

deepest parts of the wound, so as to drain off all accumulating fluids. A small piece of protective, previously dipped in the weak solution of 1 to 40,¹ but only sufficiently large to thoroughly cover it, is then to be placed over the line of junction of the edges of the wound, with openings cut in it for the drainage tube.² Over the wound now covered with the protective is to be placed a large and separate layer of gauze, which has been dipped in the weak solution of 1 to 40 of carbolic acid. This is used in order to nullify the putrefactive elements that may be deposited in the exposed layers of the dry gauze; which latter is, after stopping the spray, then applied in a thickness of eight folds, largely overlapping the wound, and having a piece of mackintosh with the rubber side down interposed between the 7th and 8th layers. If the discharge is likely to be great, a larger number of layers can be used, or extra layers placed where fluids would be most likely to gravitate. The mackintosh should be about one inch smaller than the gauze, since it is intended to convey any discharge that may soak through to it toward the edges of the dressing, where it can be detected by the surgeon or nurse while it is yet resting in antiseptic material. All fluids are thus compelled to permeate the whole dressing, and to be constantly in contact with the carbolic acid.

The dressing, now completed, requires only to be secured in place, which is best accomplished by bandages of the same gauze material, as they will not slip. The many-tailed bandage is to be preferred for stumps, since its application will not be so apt to displace the protective. If the edges of the dressing do not fit snugly to the skin, or if they come where the

to 20. Personal observation has convinced me that adhesive plaster will, in ordinary dressings, frequently interfere with primary union; so that, when its employment is demanded, I prefer to interpose a few threads of charpie between its surface and the line of the wound.

¹ In the strong solution of 1 to 20 it is often wrinkled or shriveled up.

² If, in an operation for the eradication of tumors, a large pocket is formed, or a stump is baggy, or persistent oozing occurs, a large sponge dipped in 1 to 20 solution is placed over a good-sized piece of protective, and over this the other dressings, secured by a firm bandage. The sponge is not generally required after the first dressing. It is also employed after opening large abscesses.

natural motions of the body render nicety of application difficult, the too free entrance of air can be prevented by either stuffing in pieces of crumpled carbolized gauze or salicylic cotton along the edges, or by using a bandage of elastic webbing, lightly applied so as not to give discomfort to the patient.

The dressing is changed, as a rule, whether the wound be accidental or from an operation, in twenty-four hours, even though it is not stained at its edges; and sooner, if the secretions are formed in a sufficient quantity to bring about this result. This often occurs by reason of the irritating nature of the carbolic acid, which increases to a considerable degree the secretions of the wound. If the protective is unchanged in color, the wound is certainly aseptic; if it is not, it will show dark-brownish spots, the result of the action of the liberated sulphur upon the lead in the oiled silk. These remarks about the protective hold good only of incised wounds. In contused wounds the changes of color are met with even though the wound is doing well.

To expose the wound, the same precautions as to hands, instruments, etc., are to be taken as at the operation. The spray is directed on the dressing, and particularly on its edges, and, the encircling bandage having been cut or removed, the folded gauze is carefully raised, while the spray is turned into the angle between it and the skin. The parts adjacent to the wound are lightly wiped by a carbolized sponge or cloth to remove the secretion, which is generally a bloody serum. If the evidence is favorable, washing out the wound is to be carefully abstained from, and the drainage-tube is not to be removed; nor is this to be done until the third or fourth day, unless some sign is recognized of its being choked up, as, for instance, by tension, etc. Whenever it is taken out it is cleaned in the stronger carbolic-acid solution of 1 to 20, and replaced, previously shortened, if need be, according to the granulation or closure of the wound. Lister¹ keeps them in until the wound is nearly, if not quite, healed—that is, so long as the discharge is more than the mere drainage-opening will account

¹ *Lancet*, April 3, 1876.

for, cutting them off at each dressing, and finding them often at the last dressing loose on the gauze, with their track healed.

In a redressing everything is renewed, except the mackintosh, which can be washed off with the carbolic solution of 1 to 20, and used again. It is preferable, however, to have two pieces, so that the one removed from a soiled dressing can be cleaned prior to its being employed again, when it is, of course, to be dampened with the strong solution.

The renewal of dressings, after this one of examination, depends on the profusion of the discharge, the sensations of the patient, and the temperature elevation. The latter should, in a satisfactory case, be either normal throughout or but slight in amount, and subside within forty-eight hours or thereabout. If nothing wrong occurs, the dressing can be left on for weeks, Lister¹ says, if necessary, as it sometimes is in compound fractures, etc. In one case, by sprinkling the under-surface of the gauze with salicylic acid, he kept it on for six weeks, without either odor or irritation. Generally it is retained from two days to a week.

Such is the management of wounds which can be treated *ab initio* by the antiseptic method. For those coming under this treatment some time after their infliction, such as lacerated wounds, compound fractures, and the like, a somewhat different plan must be adopted. Take, for instance, a compound fracture. Under the spray the wound is to be explored, detached fragments taken away, *secundem artem*, and a stream of carbolized solution 1 to 20—or, better still (Mr. Lister states, though I have only so far tried the former method), a stronger solution, of 1 part carbolic acid to 5 of spirits of wine (alcohol)—is to be injected into the recesses of the wound, by means of a soft rubber catheter attached to a syringe. Drainage-tubes, reaching to the ends of the fractured bone, are to be inserted, after which usual dressings are to be applied.

For suppurating wounds presenting themselves as such to the surgeon, or wounds that have failed to remain aseptic—and experience shows that they can generally be traced to

¹ "Transactions of the International Medical Congress," p. 541.

some fault in the dressing—another procedure is resorted to. It must be remarked that this failure of a dressing is not shown merely by the presence of pus, but by the odor that emanates from it as well as by the spots in the protective, for aseptic dressings will always be without any smell. And here it is well to pause a moment to say that the antiseptic treatment will not always prevent the formation of purulent matter. This absence of pus is to be hoped for; but those who have fairly tried the method (Volkmann and others) freely admit the formation of pus. “It is only just to Mr. Lister,” observes Mr. Thomas Smith, in the lecture already quoted,¹ “and essential in order to enable one to form a fair estimate of the results of his method, to remember that he is far from regarding putrefaction as the only cause of suppuration. On the contrary, he has long since pointed out that any antiseptic substance, such as carbolic acid, if applied continuously to the exposed tissues of a wound, stimulates them to granulation, and the granulations to the formation of pus, giving rise to what he calls ‘antiseptic suppuration,’ due to the direct chemical stimulus of the antiseptic.”

My own experience has shown me that the appearance of pus followed, in several of my amputations, the daily flooding of the stump with the stronger solution, which promptly and markedly diminished when this was stopped, or the weak solution used.²

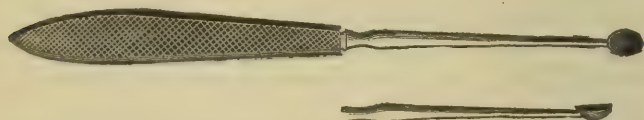
Hence the avoidance of washing out the wounds when they are found proceeding in a satisfactory aseptic manner, or simple abscesses when they are first opened.

But to return from this digression. When such suppurating wounds, old ulcers, or “failures,” are met with, they are, previous to the use of the usual dressings, swabbed out with a solution of chloride of zinc, 40 grains to the ounce. This remedy, introduced by Campbell de Morgan to the profession, for the proposed destruction of the loose cells in the incision made for the removal of cancerous tumors, forms a film over the sur-

¹ *Lancet*, March 25, 1876.

² Lucas-Championnière, “Chirurgie Antiseptique,” reports the same fact, 1876.

face to which it is applied which will remain free from putrefaction for several days. Where, however, sinuses exist, leading to necrosed or carious bone, etc., it was formerly the custom of Lister, after the operation undertaken for the removal of the diseased bone, to inject these tracks, and necessarily the wound also, with the chloride-of-zinc solution, and then to apply the other antiseptic dressings. The anticipation that the zinc would entirely eradicate all putrefaction from the wound, while a thing to be aimed at, was hardly expected by him, and indeed was but seldom perfectly satisfactory; and it was only on a recent visit to Germany that he learned that Volkmann accomplished much better results by first forcibly and thoroughly scraping out the sinuses with a small, sharp spoon, on a long shank (devised by Von Bruns, of Tübingen), and subsequently injecting them with a carbolic solution of 1 to 20.¹



In the preceding description I have endeavored to give, as clearly and accurately as possible, the details of this method, inasmuch as considerable difficulty and some confusion will be encountered by those who try to study them out in the articles that have appeared in the medical journals during the past three or four years. Some few points need only to be alluded to, such as boracic ointment, made of the strength of 1 part boracic acid, 1 part white wax, 2 parts paraffin, and 2 parts almond-oil, spread on lint, used in the place of the protective to correct the discharges coming from foul cases of caries, etc. Boracic lint, dry and wet—i. e., lint dipped in a saturated boiling solution of the acid and dried, and the same dipped in a cold saturated solution and applied moist²—is employed in both clean and sloughing ulcers, as

¹ *British Medical Journal*, December 25, 1876.

² At 212° water takes up one-third its weight of the acid; at 60° it takes up one-twenty-sixth of the acid.

a precursor to the chloride-of-zinc solutions and the usual antiseptic dressings. In its application, the protective, dipped in the watery boracic solution, is placed over the ulcer, and outside of this is laid a larger piece of the dry boracic lint dampened with the watery solution. This dressing is resorted to likewise in skin-grafting, abrasions, putrefying burns, and operations about the penis, and, in fact, about those parts where it is often impossible to use the more cumbrous gauze-dressing. For sounds and other urethral treatments (as suggested by Rolleston, in 1868), 1 part of carbolic acid to 20 of oil is used, and found unirritating.

What results have been obtained by this mode of dressing wounds must necessarily be a question of absorbing interest to surgeons. A considerable amount of material, insufficient, undoubtedly, to answer satisfactorily such a question in all its branches, has now been accumulated, yet at the same time ample enough to enable deductions to be drawn, which render it the duty of every one having the charge of surgical cases to diligently try it.

My own experience dates from March 1st of this year, and comprises a period of five months of hospital practice, three of which were spent in the Roosevelt Hospital, and two in the New York Hospital; both of these institutions, one six years old, and the other opened for the reception of patients only this year, being magnificently equipped for the care of patients.

The total number of cases which underwent the antiseptic treatment, with more and more thoroughness as time passed, was 56, 23 of which were under my own charge; and several occurred in hospital and private practice; 9 in the care of Drs. Markoe and Mason, who followed me in service at the Roosevelt Hospital; and 24 were kindly furnished me by Dr. W. T. Bull, Surgeon to the Chambers Street Hospital, to whom, let me state, I am additionally indebted for several valuable suggestions obtained by him in a recent visit to Edinburgh. This total comprises the following injuries and operations:

| | CHAMBERS STREET HOSPITAL. | | NEW YORK AND ROOSEVELT HOSPITALS. | | |
|--|---------------------------|----------------|-----------------------------------|---------|----------------|
| | Succeeded. | Failed. | Succeeded. | Failed. | Total. |
| Amputation of thigh..... | | 2 ¹ | 3 | 1 | 4 |
| “ leg..... | 1 | 1 ² | 2 | | 3 |
| “ ankle..... | | 1 | | | 1 |
| “ arm..... | 1 | | 2 | 1 | 4 |
| “ fore-arm..... | 1 | | | | 1 |
| Compound fracture of thigh..... | | 2 | 2 | | 4 |
| “ “ leg..... | 5 | 1 | 1 | | 7 |
| “ “ skull..... | 3 | | | | 3 |
| Ovariectomy and explorat’y incision..... | | | 2 | | 2 |
| Strangulated hernia..... | | | 2 | | 2 |
| Loose cartilage of knee-joint..... | 1 | | | | 1 |
| Ligation of femoral artery..... | | | 2 | | 2 |
| Excision of joints..... | | 1 | 2 | | 3 |
| Nerve-stretching..... | | | 1 | | 1 |
| Abscess..... | 1 | | 3 | | 4 |
| Bubo..... | | | 1 | 1 | 2 |
| Abscess and caries of tibia..... | | | 1 | | 1 |
| Removal of tumor..... | | | | 1 | 1 |
| Crushed toes..... | 1 | | | | 1 |
| Bursæ..... | 1 | | 1 | | 2 |
| Wounds..... | 1 | | 1 | 2 | 4 ³ |
| | 16 | 8 | 26 | 6 | 56 |

A glance at this table shows that of the sixteen cases at the Chambers Street Hospital there were eight failures, while in my own ward the failures were only six in twenty-six cases. There is a legitimate explanation for this disparity. In the Chambers Street Hospital, from motives of economy, the larger pieces of gauze were, as suggested by Lister, ordered to be washed and to be recarbolized. This was poorly done—so much so that, when an investigation was made to discover why the dressing had failed, the gauze was found to have been imperfectly cleansed and unfit for use.

In almost all the failures taking place under my own observation, retrospection detected some imperfectly-followed detail, such as the too frequent washing out of the wound, bandages too loosely applied, defective spray, and (the most common

¹ Died from sloughing and secondary hæmorrhage on the fourteenth day.

² A double amputation; died from delirium tremens on the sixth day.

³ Died from septicæmia and extensive sloughing of the wound..

cause) dressings left too long in a soiled condition. In none of my own failures, save in one case which died from septicæmia (hereafter given in detail), and one where the arm was amputated during profound septicæmia, was there anything more than ordinary free suppuration, which in itself determined the cessation of what was considered at first a troublesome dressing. Now I should wash such out with the strong carbolic or chloride-of-zinc solution, and reapply the gauze, etc.

The most interesting of these cases are herewith presented, in more or less brief outline. When not my own, the name of the attending surgeon is given.

CASE I.—*A Supra-condyloid Amputation of the Thigh* (Stokes's) was my first operation under Lister's method, and its result exceeded any that I had ever witnessed in a large military and civil experience. It was as follows:

P. C., aged thirty-two, was admitted to the Roosevelt Hospital, November 9, 1876, for caries of the lower portion of the tibia, of many years' duration. The diseased bone was gouged out with apparent benefit, but subsequently, about January, 1877, the granulations had become sluggish and hard, and eventually took on an epitheliomatous appearance—a condition which was confirmed by microscopic examination. This gradually extended, with the usual concurrent symptoms, until the posterior border of the tibia became involved, and a false point of motion ensued. Upon the patient's consenting to the amputation proposed, the limb was removed, May 14th, under the carbolic spray produced by an ordinary spray-tube and bottle attached by a rubber tubing to the steam-pipes of the hospital heating-apparatus. This threw a heavy cloud of mist, and was in this respect evidently a great improvement on the usual spirit-lamp and boiler, but was attended by the disadvantage of the steam condensing in the rubber tubing (although the steam-pipe had its proper "blow-off"), which caused the emission occasionally of a little jet of warm water over the patient and operator. This watery discharge lasted, however, so short a time that it did not materially interfere with the spray-formation. Unfortunately, I may say that we have not yet overcome this difficulty, and in our other cases were compelled to resort to the lamp previously described.¹

¹ Since writing the above, I have witnessed the satisfactory working of an ingenious contrivance of Messrs. Angelo and Rundquist, by which, through the interposition of a small copper ball in the steam-tubing near the spray tubes, the condensed moisture is collected and converted into steam by the divided flame of a fine gas-jet.

The limb was removed by a long anterior and a very short posterior flap. The femur was divided about half an inch above its articular surface, and the cartilage of the patella cut off by a flat forceps and its bony surface leveled, in order to be accurately applied to the face of the sawn femur. This done, the synovial ligaments stretching on each side of the patella were divided, to allow egress of secretion from the synovial pouch above, the wound closed after the cessation of the hæmorrhage by catgut ligatures, by catgut sutures throughout, except at the angles whence emerged the ends of the perforated drainage-tubes which traversed the stump. The usual protective and gauze bandage was then applied up to the trochanter.

At the next dressing, twenty-four hours later, everything was quiet. The skin adjacent to the wound was pale, and free from tenderness. The discharge was moderate in amount, of a bloody color, and free from any odor.

The stump was dressed again three days later when the tube was removed. Union by first intention had occurred, except where the tubes had been lodged. During this time, he had surprised me, even at my first visit to him the day after the amputation, by the ready and painless way in which he used the stump, and on the third day he actually *waved it about*, to show me how easy he was.

On the third dressing, May 20th, a pale spot half an inch across, on the farthest extremity of the anterior flap, showed, by its darkening a little, that it was dead, but its separation was accomplished with little or no irritation. In short, the patient was out of bed in eleven days, and, had my fears permitted it, he would have been out by the eighth day. Some of the sutures were removed at the fourth dressing, 22d inst., much reduced in size, and some were absorbed. The stump could then bear firm pressure with the hand. The absolute healing of the little ulcers resulting from the drainage-tubes took place a short time later. His temperature, the day after the operation, rose to $100\frac{1}{2}^{\circ}$, and after that did not at any time exceed $99\frac{1}{2}^{\circ}$.

CASE II.—*A Second Supra-condyloid Amputation of the Thigh*, wherein failure threatened, but was averted.

T. M., aged fifty-four, was admitted to the Roosevelt Hospital June 6, 1877, with an epithelioma of the left leg, of nine months' duration, which had attacked a cicatrix. The ulcer was then two and a half inches in diameter.

On June 21st, Stokes's supra-condyloid amputation (a modification of Grritti's) was performed under Lister's spray. Considerable oozing occurred, requiring sponges to be applied over

the stump, secured by bandages, over which the gauze, etc., were applied. Drainage-tubes used. Dressing renewed next day. Temperature $100\frac{1}{2}^{\circ}$. Pulse 92. The stump did well, with but a little watery discharge. No pain was felt for four days, when a slight odor was detected, and the union of the flaps retrograded, with an elevation of the temperature to 103° . Burrowing was found next day to have occurred on the posterior aspect of the thigh, which was arrested by a counter opening, and drainage-tube there inserted, after washing the stump and track out with the carbolic acid 1 to 20. This arrested the inflammatory action, and the temperature fell to 99° , but the stump healed by granulation satisfactorily, though slowly. Granulations varied from a large and flabby condition to the small and irritable. This was relieved a little by applying boracic acid to the ulcer, with a continuance of Lister's treatment. Final closure hastened by the use of red-wash.

CASE III.—*Amputation of the Arm*, performed on a youth of seventeen, for a railroad-crush of the hand and forearm just above the elbow, by skin-flaps and circular division of the muscles, under the carbolic spray. Catgut ligatures used; drainage-tubes inserted into angles of wound; wound closed by carbolized gut sutures, and protective and gauze dressing applied to the stump. Union by first intention occurred, save at sites of drainage-tubes. No pus formed, only a slight, glairy, brownish discharge; no pain felt, and no swelling seen. First dressing twenty-four hours after operation, second on third day, and on the fifth day (third dressing) the tubes were withdrawn, by which time the union was firm, and at the next dressing the little ulcers produced by the tubes were closing rapidly. The temperature-table showed some elevation for a number of days, but this was due to the free suppuration and burrowing of a scalp-wound that had been dressed in the ordinary way. As far as the antiseptic treatment went it answered most admirably.

CASE IV.—*Amputation of the Thigh*, by Dr. Mason, August 3, 1877, for a railroad-injury which had ground up the leg and caused considerable laceration of the lower third of the thigh. Circular amputation of the thigh just above its middle was performed the same evening, under antiseptic spray, with the ligatures, sutures, drainage-tubes, and dressings, as usual. The femoral vein was also ligated. Temperature on the second day rose for a little while to $100\frac{1}{2}^{\circ}$, but after that to not more than a degree above the normal figure. On the third day this was the hospital record: "Patient passed a comfortable night; has no pain; temperature $99\frac{4}{5}^{\circ}$; stump looking beautiful, and not at all sensitive. There is primary union throughout the whole

face of the stump, except at corners where the drainage-tube projects. The discharge is slight, reddish, and inodorous. The sutures (catgut) already seem partly absorbed." He went on steadily to recovery, without any untoward symptoms.

CASE V.—*Amputation of the Leg*, by Dr. Markoe, October 9, 1877, for a railroad-injury involving the ankle-joint. The leg was removed by skin-flaps and circular division of the muscles, under the carbolic spray, and dressed after Lister's method. Six dressings were used in eleven days, and the wound healed by first intention, save at the drainage-openings. Only a glue-like discharge noted, never purulent. Temperature on second day, $100\frac{1}{2}^{\circ}$; same evening, $99\frac{1}{2}^{\circ}$, which it did not after this exceed. The result was eminently satisfactory.

(To be continued.)

ART. II.—*The Lymphatic Theory of Syphilitic Infection; with a New View of the Relation between the Chancre and Chancroid, and Suggestions for the Treatment of Syphilis.*¹ By WILLIAM A. HARDAWAY, M. D., St. Louis.

PART I. THE LYMPHATIC THEORY OF SYPHILITIC INFECTION.
—In 1870 I wrote a paper on "The Pathology of Early Syphilis," and in 1872 I prepared another article,² maintaining substantially the same views. I declared that, in opposition to the commonly-received opinions of the immediate absorption of the syphilitic virus by the blood, I was convinced by certain pathological and clinical considerations that the "poisonous principle is taken up by the lymphatic vessels, carried to the ganglia nearest the point of initial lesion, and, after there undergoing a period of localization for a variable length of time, subsequently passes into the general circulation; and that, therefore, syphilis is never *ab initio*, but only secondarily a blood affection." I confess that I was at first ignorant that this theory had ever been broached before; but I shall presently show how much I was mistaken in this regard. To-day, in addition to a review of the whole subject, I purpose pushing my inquiries a step further, to see if this

¹ Read before the American Dermatological Association, at Niagara Falls, September 6, 1877.

² *St. Louis Medical and Surgical Journal*, May, 1872.

theory of lymphatic absorption will throw any light upon the *questio vexata* of the unity or duality of the syphilitic poisons.

In the first part of this paper, I shall discuss the method of syphilitic infection; in the second part, the nature of the so-called chaneroid; and in the third division of the subject I shall take the liberty of offering certain suggestions for treatment.

John Hunter,¹ believing the lymphatics to be the only absorbents, states that "the venereal matter is taken up by the absorbents of the part in which it is placed." He seems to have considered, however, that it soon traversed this system, and was carried into the general circulation.

Swediaur² shared the same view, as, indeed, did almost all writers who followed Hunter; "and," says Mr. Lee, "the theory itself, so far as regards the syphilitic poison, was, up to a comparatively recent date, scarcely questioned." The whole modern school of syphilographers, however, are, with hardly an exception, unanimous for the blood-absorption theory of constitutional infection—some contending that the virus enters the organism at the moment of inoculation, and others that a few days elapse before this result is accomplished; but all, or nearly all, are agreed that the virus is taken up by the blood-vessels alone, and immediately received into the mass of the circulating fluid.

Mr. George G. Gascoyen was the first writer of recent date who entered a protest against the prevailing doctrine of infection. In an article in the *Lancet* for December 13, 1864, "On the Unity of the Syphilitic Virus"³—after presenting some arguments in favor of the absorption of syphilitic poison by the lymphatics—Mr. Gascoyen asked: "Does not this lead us to infer that the syphilitic virus . . . enters the system *indirectly* through the medium of the lymphatics? This poison is carried by these vessels to the chain of glands in immediate relation with the sore, and is gradually passed on through the numerous sets of glands which successively inter-

¹ "Treatise on the Venereal Diseases," Philadelphia, 1791.

² "A Complete Treatise on the Symptoms, Effects, Nature, and Treatment, of Syphilis," Philadelphia, 1815.

³ *Braithwaite's Retrospect*, July, 1865.

fere to prevent the admission of any noxious material into the circulation."

Prof. F. N. Otis, of New York, in an able paper entitled "The Physiology of Syphilitic Infection,"¹ read before the New York County Medical Society, June 1, 1871, likewise doubts the fact of absorption of the syphilitic virus by the blood-vessels. After an ingenious and rational argument in support of the view of lymphatic absorption, he concludes that, "according to this view, syphilis is a local disease up to the period of the entrance of the disease-germ into a lymphatic canal; and I am also of the opinion that, instead of infecting the system at large, even at this time, it passes on through the lymphatic vessels into the parenchyma of the lymphatic gland, with which it is connected, where it is retained by conditions arising from the character of the parenchyma of the gland, and the coagulation of its tissue-fluids, for a period corresponding to the so-called secondary incubation of syphilis."

Virchow² also seems to entertain a somewhat similar opinion. "He compares," says Otis,³ "the early manifestations of syphilis to those of malignant tumors—at first local in character, the nucleus of which, extending in depth and on the surface, implicates the lymphatic glands of connection; and suggests that, as in cancer, the glands collect the hurtful ingredients, and thus for a time afford protection to the rest of the body; finally, after complete impregnation, acting from time to time as new foci of infection for the general system." The associate chlorosis he considers the result of glandular irritation, which is known to accelerate the development of the white blood-corpuscles.

Bristowe⁴ thinks that "it is probably through the lymphatic glands mainly, if not entirely, that the poisonous principles of syphilis, of tubercle, of cancer, and of various other malignant diseases, gain entrance into the blood, and thus infect the system at large; and it is not improbable that the

¹ Reprinted from the *New York Medical Gazette*, 1872.

² "Cellular Pathology," Chance's translation.

³ *Loc. cit.*

⁴ "A Treatise on the Theory and Practice of Medicine," Philadelphia, 1876.

specific poisons of the various infectious fevers generally pass into the system through the same portals."

Lancereaux¹ remarks that, "as regards the manner of absorption of the syphilitic virus, it is a question that ill bears discussion. The agents of absorption of the syphilitic virus are those of other substances, viz., the venous capillaries, and *more especially, perhaps, the lymphatic vessels.*"

Bäumler² asserts that "it is not to be doubted that a portion of the poison *may* be taken up directly by the blood-vessels circulating (?) in the primary affection and in the indolent buboes," although, in the same page, he states that "Fournier has reported certain observations which tend decidedly to sustain the Hunterian doctrine."

Having now given a *résumé* of the opinions of those authorities who are inclined, wholly or in part, to accept the lymphatic theory of absorption in syphilis, I shall proceed to a more immediate discussion of the questions under consideration. But, before going further, I would beg the privilege of restating the propositions which I shall attempt to prove:

1. That the lymphatic vessels are the only absorbents of the syphilitic virus.

2. That the syphilitic virus is carried by the lymphatic vessels to the ganglia nearest the seat of primary lesion, where it undergoes a period of localization corresponding to the stage of secondary incubation; and that, therefore, for a certain variable space of time the blood is not contaminated at all, and, if inoculated upon a person free from syphilis, would not prove a source of infection.

It would not be within the scope of a paper of this character to enter minutely into the many physiological and pathological questions involved, so I shall be as brief as possible in their discussion; but I am in hopes that the phenomena of syphilis itself, interpreted as it seems to me they should be, will give an answer to some of these unsettled problems.

Carpenter³ says: "It may be stated, then, as a general

¹ "A Treatise on Syphilis: Historical and Practical." New Sydenham Society, London, 1868.

² "Syphilis." Ziemssen's "Cyclopædia," vol. iii., New York, 1875.

³ "Principles of Human Physiology," Philadelphia, 1876.

proposition, that the function of the absorbent system is to take up, and to carry back to the circulatory apparatus in a state of higher elaboration, such substances as are capable of appropriation to the nutritive processes, whether those substances be directly furnished by the external world, or be derived from the disintegration of the organism itself. We have seen that in the lacteals the selecting power is such that those vessels are not disposed to convey into the system any substances but such as are destined for this purpose; and that readily diffusible matters are absorbed in preference by the mesenteric blood-vessels."

Dalton¹ states that the elements of the blood, even in the physiological condition, transude in part from the capillary vessels, and are again taken up by absorption by the *lymphatic vessels*.

Küss² regards it as the office of the lymphatics to remove the products of tissue-metamorphosis. Bristowe³ writes that "indeed it is almost impossible to suppose that those slightly diffusible substances, albumen and fibrinogen, should in the face of the opposing pressure from within the blood-vessels be capable of reëntering them, or that particles, whether indifferent or specialized, should be removable by any other route than that furnished by the open mouths of the lymphatics. That these are the main agents, however, in the removal of probably everything save a variable proportion of water and dissolved salts, is shown by the tendency which, when largely overworked, they and the glands in their course have to become enlarged and presently inflamed, or involved in the identical process going on at the seat of absorption." It is not surprising, then, with the views now entertained of the peculiar function of the lymphatics, that the opinion should be gaining ground among pathologists that it is through this system of vessels that various infectious materials gain access to the general organism.

Virchow would seem to consider this the chief channel of infection to the body. Billroth⁴ affirms that, in contused

¹ "Human Physiology," Philadelphia, 1871.

² "A Course of Lectures on Physiology," Boston, 1875.

³ *Loc. cit.*

⁴ "Surgical Pathology," New York, 1871.

wounds, decomposing shreds of firm connective tissue often lie for a long time on granulating wounds without any septic poison passing from them through the superficial vessels of the granulations into the blood. The most apparent reason for this is due to the fact, demonstrated by Billroth himself, that *granulation-tissue has no lymphatic vessels*. In another paragraph he states that, where purulent infection does take place, it seems evident that the poison is absorbed chiefly by the lymphatic vessels; but he does not deny that *possibly* in certain swollen states of the walls of the blood-vessels, as well as from capillary attraction, and also through the thrombi of the vessels, infectious materials *may* reach the blood, nor that cells take up septic molecular substances, and *may* wander with them into the blood-vessels; but, on the whole, he considers this mode of infection the exception, especially if the infectious substances be not dissolved, but exist as very fine molecules (page 324). On page 360 of the same work the author shows how morbid material from the cadaver, especially if introduced through small lacerated wounds that do not bleed, is taken up by the lymphatic capillaries and passes into the lymphatic vessels; that coagulation may quickly take place here, and then the putrid matter acts as a specific irritant on a small part only; or that, in other cases, it acts on the lymph as a ferment, and the lymph coagulates in the next lymphatic glands, or else the swelling of the gland compresses the intra-glandular vessels, and so obstructs the passage through the gland; in this case also the disease remains local.

It is to be presumed that the application of the specific irritant of syphilis to the tissues produces the usual phenomena of inflammation, with the exit of numerous white blood-corpuscles from the vessels. From our physiological and pathological knowledge of these bodies, it is a just inference that the syphilitic virus becomes incorporated in their substance, and that sooner or later they make their way into the lymphatic vessels, and along them into the neighboring ganglia.¹

¹ According to Wagner ("Manual of General Pathology," page 248), "an inflammation in vascular or non-vascular parts either retrogrades or is followed by other processes. In the former case not only the transuded

Whether the syphilitic virus has difficulty in penetrating the tissues to meet the lymphatic vessels, or whether the virus is carried immediately to the contiguous glands, it is impossible to determine. All are agreed, however, in calling the time between the infection and its local expression the period of primary incubation. It is very probable that, in the first few days after inoculation, the trouble is local. As Ricord¹ wittily says, although in another sense from that used here, he cannot conceive of a poison brooding at a distance, and afterward retracing its steps to be *hatched* in the *nest* where it was deposited. The advocates of instantaneous constitutional infection have sought to prove their position by certain illustrations from the *acute* infectious diseases, e. g., cupping after vaccination, excision, and cauterization after the application of acute glanders-poison, etc., without preventing their several specific constitutional effects. All this does not show, however, that these poisons are directly absorbed by the blood; on the contrary, I believe that the various infectious maladies pass into the blood through the lymphatics, but that the difference in the time occupied in gaining access to the general system is due merely to the nature of the morbid material. But any analogy instituted between these acute affections and syphilis, an essentially chronic malady, is unfortunate. As the syphilitic virus has never been subjected to any of the experiments just mentioned, viz., immediate cauterization and excision of inoculated parts, we cannot determine as to how long the poison remains localized before absorption by the lymphatics.

In seeking to inform ourselves on these points, we find in hydrophobia—a disease chronic in its course, dependent upon a virus, and propagated by inoculation only—a much happier analogy to syphilis, which exists under exactly similar conditions.

Bollinger,² Hammond,³ Youatt, and indeed all observers, plasma is reabsorbed, but also the colorless blood-corpuscles disappear, because they can pass out of the connective-tissue spaces into the lymphatic vessels, and thence again into the blood."

¹ "Letters on Syphilis," Philadelphia, 1852.

² Ziemssen's "Cyclopædia," vol. iii.

³ "Treatise on Diseases of the Nervous System."

are agreed upon the fact that immediate destruction of the hydrophobic lesion will undoubtedly, in many instances, prevent the outbreak of the general affection.¹ Hill's² case, where he cauterized a laceration of the frenum, made during violent intercourse, *twelve hours* after occurrence, would seem to show that absorption in some instances is very rapid. Bäumlér,³ in quoting this very case, remarks that "experiences of this kind only prove that the extent of the local action of the virus and its first effects cannot be accurately appreciated." He further mentions well-authenticated instances (Hüter, Humphrey, Sigmund, Vogt) where excision or cauterization of the primary sore was successful in preventing constitutional symptoms, "which could not have been the case," he adds, "were the syphilitic papule a manifestation of the general infection of the organism." I believe that in a certain proportion of cases destruction of the initial lesion would prove futile, as I am of the opinion that the virus is soon carried to the lymphatic glands, as is evidenced by these bodies undergoing the same processes as obtained in the primary sore; and this would explain why total destruction of the inoculated parts has generally proved unavailing. Otis⁴ accounts for the widely-varying periods of incubation by the distribution of the lymphatics: incubation is brief where the lymphatics are most superficial, and, where no incubation at all has been observed, he thinks that the virus has been introduced directly into a lymphatic vessel.

Induration of the syphilitic ulcer is purely a local affair, and consists of nothing more than a greater or less profuse proliferation of cellular elements; and, in some cases, of a true new formation of connective tissue from the infiltrated cells. According to Rindfleisch, the chronic induration of the glands is due, "not so much to a hardening and enlargement of the reticulum, as to a very uniform though by no means

¹ Billroth ("Surgical Pathology," page 363), speaking of hydrophobia, says: "Where the poison remains hidden during this long time (incubation period), whether in the cicatrix, *in the next lymphatics*, or in the blood, is entirely unknown."

² "Syphilis and Local Contagious Disorders," Philadelphia, 1869.

³ *Loc. cit.*, p. 246.

⁴ *Loc. cit.*, p. 26.

exuberant production of young cells in all parts of the gland." Thus it will be seen that these new formations are composed of the usual tissue-elements, and not of a specific material peculiar to syphilis, although the manner of their genesis is possibly the result of certain actions inherent in syphilitic virus.

I have already mentioned that the lymphatic glands of connection undergo a process similar to that which has already taken place in the sore ; but the manner in which they become involved, first one and then another in the line of invasion, shows very conclusively that the specific material meets with a resistance of some sort in its passage from gland to gland ; that the lymphatic glands interfere to prevent the entrance of noxious materials into the body, thus for a time warding off general contamination, is fully acknowledged by pathologists for other diseases.¹

Henry Lee² expressly declares that, "although the lymphatic vessels absorb, the lymphatic glands interrupt the passage of the venereal poisons, and do not allow them to pass until their specific local power of producing fresh irritation has, in some way or other, been destroyed." But Mr. Lee thinks that the glands of the second order—those glands which receive their lymph from other glands—never become affected through resorption of the virus from the primary lesion ; and, therefore, concludes from this fact, and from certain irrelevant physiological experiments on absorption by the veins, that the organism is not affected through the medium of the lymphatics, but through the blood circulating either in the primary sore or in the primarily diseased gland. In disproof of this assertion, and as going very far in corroboration of the theory of exclusive lymphatic absorption, I beg leave to present the following observations :

In a case reported by Bidentkap, inoculations were made on the left side of the thorax ; some weeks afterward an indurated gland was discovered above the largest of the papules, and subsequently a hard cord could be distinctly felt extend-

¹ In this connection, in addition to the passage referring to the extension of the morbid process in dissecting wounds, consult especially the works of Billroth and Virchow.

² "Lectures on Syphilis," etc., 1875.

ing upward to the next gland, which was likewise enlarged, and from this another cord led as far as the axilla, where it was lost in a large, somewhat movable, glandular swelling. In another case occurring in Bidentkap's practice, the same series of phenomena was noticed, but which is so similar to the above as not to require repetition. Fournier¹ relates the following: "In the collection of the Hôpital de Lourcine there are three preparations of women who died of intercurrent diseases while afflicted with syphilitic sores on the vulva. In these preparations, not only the inguinal glands are swollen, but there is an hyperplastic enlargement of a number of glands above Poupart's ligament. In the second case, there occur in the fossa iliaca, along the blood-vessels, nine enlarged glands, arranged in three groups, one above another, the uppermost at the origin of the art. hypogastrica. The enlargement of the glandulæ iliacæ had attained nearly the same degree as that of the glandulæ inguinales, among which one or two on each of the three preparations were distinguished through their greater size as the ones first attacked."

Since these observations prove beyond dispute that the lymphatics are one of the chief channels of infection to the system, it may be asked what reasons are there, in addition to the theoretical ones already advanced, for believing that the blood plays no part in absorption at all. Köbner² observes that, for the purpose of determining this question, "it would be desirable to inoculate the blood of persons who show no other indication of syphilis than a very recently developed papule, upon healthy subjects who submit themselves voluntarily to the experiment."

As this has never been done, the experimental inoculations of Boeck and Bidentkap, which I shall now present, suffice to answer this inquiry completely and satisfactorily.

CASE I.—O. C., who had never had constitutional syphilis, came into the hospital on the 26th of August, 1861, with a slightly indurated ulcer upon the orifice of the urethra, and two erosions upon the left labium. From the ulcer in the com-

¹ "Leçons," p. 213, quoted by Bäumlér, *loc. cit.*, p. 122.

² Bäumlér, *loc. cit.*

missure, the skin of the thigh was artificially inoculated. For the first fourteen days nothing further was noticed at the inoculated place, and consequently no further examination was made of the patient until the 27th of September. There now appeared at the point inoculated an ulcer of the size and shape of a split almond, which was seated upon a *deep and extensive induration*. This had, therefore, taken *fourteen days* at least to develop; and, according to the patient's statement, nearly three weeks. The ulcer having healed, the patient was discharged upon the 14th of October, but returned February 22, 1862, with the symptoms of constitutional syphilis.

CASE II.—J. S. entered the hospital January 3, 1863, with an eroded, well-marked induration in the retro-preputial fold, slight swelling of the inguinal glands, but otherwise no symptoms of syphilis. The disease had been contracted toward the middle of December, and the girl from whom he acquired it was admitted into the hospital December 10, 1862, with moist papules upon the genitals. On the 9th, 10th, and 11th of January inoculations were made upon the side of the thorax, with the secretion of the chancre, but without any immediate effect. January 12th, pulverized sabina was strewed upon the chancre, and by this means in a few days a copious suppuration was induced. The pus thus obtained being inoculated in the left side of the thorax, caused at first only little pustules, which soon dried up; but, January 17th, an inoculation made from this pus produced a large pustule, surrounded with a red areola, which in a few days turned into an ulcer. An inoculation performed on the 24th of January had the same result. February 5th.—The artificial ulcers are healing. At the places inoculated on the 9th of January, and the day following, only pale-red papules are to be seen; at the place that was inoculated on the 9th the papules are of the size of a pea, at the other places they are smaller; at those made on the 12th they are the size of pin-heads. These papules were seated regularly in threes at the points inoculated, and at places even where it was supposed the inoculation had failed. The papules increased daily in size, became more prominent, were surrounded by a red areola, were themselves of a more livid color, and finally showed at the top a com-

mening desquamation. On the 9th of February a small, movable, hard, not tender gland, was discovered above the largest papule mentioned. On the 11th of February, a slight roseola, later moist papules on the scrotum, and erosions on the mucous membrane of the pharynx. Expectant treatment. For some weeks the papules increased in size, the scabs became thicker, and on the 22d of February the oldest were covered with a thick, reddish-brown scab, which, upon being removed, revealed a dark-red, slightly moist surface. April 23d—the scabs had fallen off, and the papules were somewhat flatter and of a browner color. The largest had a diameter of from three to four lines. From the indolent glandular swelling on the right side of the thorax a hard cord could be distinctly felt, extending upward to the next gland, which was likewise enlarged, and from this another cord led as far as the axilla, where it was lost in a large, somewhat movable glandular swelling. Brown-colored spots were left by the papules.¹ Several more cases of a like nature are reported by the same authorities, but the space at my command will not admit of their recital. Cullerier² reports a case similar to these that occurred in the service of M. Puche, at the Hôpital du Midi, which he says “is unique, perhaps, in the history of science.”³ Condensed, it reads as follows: Puche inoculated a man on the abdomen with the secretion of a chancre that had been followed by constitutional syphilis. This was on the 29th of January, 1862. As nothing had appeared at this point by the 19th of February, the inoculation was considered a failure, and with the secretion of a hard chancre, twenty days old, another puncture was made a little below the first one. On the 8th of March, thirty-nine days after the first inoculation, and twenty-seven after the second, *two papules* situated on *indurated bases*, and which had all the characteristics and followed the usual course of infecting chancres, made their appearance. The papule from the *second* inoculation was larger than that from the first. On the 10th

¹ Bäumlér, *loc. cit.*

² “Atlas of Venereal Diseases,” p. 28.

³ He was not aware, of course, of the experiments of Boeck and Bidentkap, made about the same time.

of April there were general roseola and other specific symptoms.

For a long time it was held as one of the best arguments for immediate constitutional infection that the true chancre was not auto-inoculable; then, when it was discovered that a chancre which had been rendered purulent could be inoculated upon its bearer, it was claimed that sores thus produced were merely chancroids; but now that true chancres when auto-inoculated are seen to originate other true chancres—that is, when the inoculations have been performed in the incubation-stages—the last refuge is in the supposition that the blood has not as yet become fully saturated with the syphilitic virus. This hypothesis is clearly untenable by those who regard the chancre and the ganglionic involvement as the result of syphilis already in the blood; for, if there were sufficient of the virus absorbed to produce these local manifestations, there should most assuredly also be sufficient to prevent fresh inoculation with syphilitic virus; and those holding with Bäumler and other authorities that it is possible to prevent constitutional infection by destruction of the initial lesion, surely cannot account for these cases in this way.

The clinical history of a case of early syphilis, I think, affords quite positive evidence as to the manner in which the syphilitic virus enters the blood. We find that, exactly where the specific irritant comes into contact with the tissues, certain characteristic changes occur, which sometimes can also be detected in the lymphatic vessels leading to the neighboring glands, and invariably in the glands themselves, and again in the next glands and in the next, and so on, slowly and gradually, until more or less marked constitutional symptoms for the first time supervene, and we are made aware that the syphilitic poison is but then being poured into the blood. If the virus were immediately absorbed into the blood, we should expect to see evidences of systemic disturbance at once. This assumption is sustained by the difference in the results obtained by the insertion of animal poisons (putrid matter) in the tissues, and their direct injection into the veins. In the former case, according to Wagner,¹ the phenomena appear

¹ *Loc. cit.*

more slowly and are milder, are even entirely absent; in the last they appear more rapidly and are more intense.

The unanimous concurrence of all who have made hereditary syphilis a study, in the belief that, if a mother contract syphilis in the latter part of pregnancy, her offspring will be born without taint, is a strong argument against the theory of immediate blood-absorption. The only explanation that this curious circumstance admits lies in the fact that the child is born before the virus has passed out of the lymphatic system into the blood; for, if its introduction into the blood were immediate, serious results would ensue to the child at whatsoever period of utero-gestation the disease had been acquired by the mother. I am aware that Kassowitz¹ has shown that a foetus having syphilis due to paternal influence does not infect its mother with any of the appreciable lesions of the malady; and that a mother contracting syphilis during even the early months of pregnancy does not contaminate her offspring in the ordinary manner. Kassowitz accounts for this double immunity by presuming that the virus of syphilis is contained in the formed elements of the blood, which do not pass "through the partition-wall or septum of the maternal and foetal vascular systems."

While I am constrained to agree with Kassowitz that neither the mother bearing the syphilitic foetus, nor the foetus of a mother infected after pregnancy, presents any of the typical symptoms of syphilis, yet a careful consideration of facts shows that a peculiar syphilitic influence has been exerted on both—on the child if the maternal chancre was acquired long enough before delivery to allow of the general evolution of the disease, and in the mother at any period. It is impossible to imagine, when we recall the intimate processes of the placental circulation, how syphilis could exist in the mother without affecting or modifying in some way the foetal organism, or *vice versa*. That a modified form of syphilis occurs under these circumstances is shown by the fact, first pointed out by Colles, that a healthy mother, or rather one without the ex-

¹ "Hereditary Transmission of Syphilis," translated for the NEW YORK MEDICAL JOURNAL, February, *et seq.*, 1877.

ternal signs of the disease, can nurse her syphilitic child without contracting syphilis, while the same child will contaminate a healthy wet-nurse; and further, Fournier¹ has declared that a syphilitic mother will not infect her seemingly healthy child. These several phenomena make it probable that the white blood-corpuscles continue to be the carriers of the specific poison, since these formed elements are not capable of passing over from the one organism to the other, and thus producing the coarser characteristics of syphilis; while the usual placental processes, intimate as they necessarily are, suffice to convey a decidedly syphilitic influence.

The assumption that the white blood-corpuscles take up the syphilitic virus is likewise much strengthened, when it is remembered that the serum of the blood is not infectious, and that the passage of white globules into the secretions, e. g., saliva, mucus, milk, which are also innocuous, has not yet been demonstrated (Wagner).

At some future time I shall give the result of my studies on the manifestations of constitutional syphilis, as tending to show the involvement of the lymphatic system throughout the whole course of the disease.

PART II. THE RELATION BETWEEN THE CHANCRE AND CHANCROID.²—The secretion of the chancre is described by Fournier as being scanty and sero-sanious, while that of the chancroid is abundant and consisting of true pus. These characteristics are agreed to by all authorities. I recognize both venereal sores—the chancre and the chancroid—as dependent upon inoculation with the syphilitic virus, but that the chancroid, or soft suppurating sore, is due to the greater virulence of the contagious agent, or more especially, perhaps, to a pyogenic predisposition of the person infected. When the syphilitic virus is inoculated upon an individual predisposed to pus-formation, or when the virus has been rendered purulent by irritation, there is induced profuse suppuration in the tissues where it is implanted, and as a consequence is not gen-

¹ *Journal de Médecine et de Chirurgie Pratiques*, July, 1877.

² This name is retained for convenience' sake, and as being well understood in this country, but not with any pathological significance.

erally absorbed even by the lymphatics, and a purulent ulcer or chancroid is the result; but if the virulent pus does undergo absorption, that office is *always* performed by the lymphatic vessels, and invariably produces acute suppuration in the neighboring glands; elimination occurs, and the malady still remains local. That it is the exception for the chancroidal virus to be absorbed, and that if it is the lymphatics are the routes of absorption, and that a suppurating bubo necessarily follows, we all know practically. Rollet¹ has shown, and his observation has been confirmed by Köbner, that the pus-globules in the chancroidal secretion are the only bearers of the virus, and as pus-corpuscles are merely transformed white blood-corpuscles, possessing as they do the properties of amœboid movements and of grasping foreign substances, it would seem that while in one instance the syphilitic irritant produces a transudation of white blood-globules only, in another the infecting agent, owing to reasons mentioned above, causes their immediate conversion into pus-corpuscles. Pathology teaches us some interesting lessons of the part which suppuration plays in the prevention of infection to the body. We already know that pus is rarely absorbed in the chancroid, and that putrid substances placed upon freely suppurating wounds remain innocuous. Wagner,² speaking of artificial tuberculosis, says that "inoculation appears to succeed better if small quantities of a not too irritant character are employed; while larger quantities and substances more strongly irritant commonly give rise to stronger inflammation and *suppuration*, but not to tuberculosis."

Billroth³ describes a form of cadaveric poisoning with which there is always suppuration at the point attacked, but in which the trouble remains local. In inoculating small-pox, it was deemed necessary, in order to gain the required effect, to take from a pock which had not commenced to suppurate.

Any one who has done much vaccinating must have met with cases where normal vaccine has produced acute suppurating sores—similar to the chancroid—which were worthless

¹ Bumstead, *loc. cit.*, p. 338.

² *Loc. cit.*, p. 455.

³ *Loc. cit.*, p. 360.

for protection, subsequent successful vaccination proving this, while the same virus in others has run a typical course. Smith¹ states that, if a vaccine vesicle is made to suppurate from irritation, the resulting scab is utterly unreliable. One of the most satisfactory demonstrations, however, of this pathological law is found in the hard chancre itself. Lancereaux,² in his chapter on the syphilitic virus, remarks that "purulence is here opposed to virulence; *for, so soon as pus appears, the virulent power diminishes, and contagion is often impossible.* The liquid which is seen to ooze from the chancreous erosion is the best type which can be given of the syphilitic virus; then, in fact, the virus is not mixed either with the detritus proceeding from a much-indurated chancre and already in a process of retrograde evolution, or with the pus secreted by the chancre during the healing process, or with the pustule of erythema or any other lesion." This author conceives that the virus of syphilis is contained in the blood-globules. With the facts gained from analogy, with the belief that white blood-corpuscles are the carriers of syphilitic virus in the hard chancre, together with the knowledge that pus-corpuscles contain the infecting element of the chancreoid, or suppurating sore, it does not seem improbable that the two ulcers are the result of one and the same poison, it being merely a question of purulence or non-purulence as to their ultimate effect upon the system.

The position here taken is fully sustained by the following reports of inoculations :

The anonymous physician of the Palatinate inoculated three persons free from syphilis with undoubted syphilitic virus, and the points of puncture became at once inflamed; two of them healed after *suppurating* from eight to ten days; in another pustules filled with sanious pus appeared in four places two days after the inoculation. On the following day they became confluent, and were accompanied by violent inflammation of the cellular tissue; on the sixth day a slough formed. None of the three cases were followed by consti-

¹ "Diseases of Infancy and Childhood," Philadelphia, 1876.

² *Loc. cit.*, p. 210. Italics my own.

tutional symptoms. Boeck¹ proved that the syphilitic virus could be inoculated upon virgin soil, and that the resulting ulcers would have the faculty of further inoculability *just as in the chancroid*. A woman suffering from chronic eczema was treated by Boeck with inoculations from soft chancres. Upon a relapse of the eczema five years subsequently it was the intention to treat her in the same manner again. But at Boeck's suggestion she was inoculated by Bidentkap with the secretion from a hard chancre. Large *pustules* resulted, with superficial ulceration. The pus from this took in three generations. *General syphilis did not follow*. Bäumler accounts for these cases on the supposition that in the first series acute suppuration destroyed the syphilitic virus,² and in Boeck's case that the secretion used was from a sore which had been made to suppurate from irritation, and that therefore the syphilitic virus was too much *diluted* to take effect—certainly most unscientific explanations. I cannot understand how suppuration can destroy a virus, or, having Davaine's experiments in mind, how a virus can be diluted beyond the power of infection. Indeed, common experience contradicts this last hypothesis. The only rational and philosophical solution of these facts rests upon the assumption that in the first three cases the irritation produced was of such a character that the white corpuscles were immediately, or at least very soon, transformed into pus-corpuscles, and consequently did not produce infection; and in the last case the surface of the chancre was undoubtedly made purulent, and the pus-corpuscles when inoculated caused soft ulcers only. The following condensed case, likewise reported by Bidentkap, will further support my position: Oline Martinsdatter, who had never had syphilis, was admitted into the hospital for gonorrhœa. While there she inoculated herself on the epigastrium with a needle. The matter was taken from the artificial ulcers of a patient who was undergoing syphilization for constitutional disease. These ulcers had been produced many generations back by inoculations from an infecting chancre. An ulcer with a

¹ All of these cases are taken from Bäumler, *loc. cit.*

² This is the view taken by Michaelis, a unitist, in explanation of the non-infecting nature of the chancroid.

copious discharge was the result, and by spontaneous inoculation another ulcer formed by the side of the old one. This girl was observed repeatedly and for a long period, but she failed to present any symptoms of syphilis. This was in 1862. In 1864 she returned to the hospital with a chancre, which was followed by roseola and other constitutional symptoms. Bumstead,¹ who quotes this case, is at a loss to understand how a sore, originating in a syphilitic person from inoculations made from a hard chancre, fails to produce syphilis in a person free from it. The only escape from this dilemma lies in the fact that the original chancre was rendered purulent to secure its secretion for syphilization, although any irritating matter will generally cause suppuration in a syphilitic person, and that it transmitted itself in kind, and that it was the purulence of the sore which prevented its producing syphilis in an individual free from syphilis. The objection may well be raised here that constitutional syphilis has occasionally followed inoculations with purulent secretions. I acknowledge that there are a few cases of this description on record. In explanation of these instances I likewise must recognize the existence of a form of "mixed chancre," but not exactly in the acceptance of Rollet's invention. I believe that a few white blood-corpuscles may sometimes be inoculated along with the pus-corpuscles, or that, even when the entire infecting material is composed of pus, it does not follow that all of the white corpuscles at the point of attack are converted into pus-globules, owing, perhaps, to the lessened activity of the irritant, or the non-tendency of the subject inoculated to pus-formation. I think that this hypothesis gives a more scientific comprehension of the "mixed chancre," or rather of those numerous cases observed by men of unquestioned diagnostic acumen, in which general syphilis has ensued upon undoubted soft sores.²

Of such a nature is the following case: A young woman, who had never had syphilis, inoculated herself with a number of chancroids from the ulcers of a patient undergoing syphili-

¹ *American Journal of Medical Science*, April, 1873.

² Consult J. R. Lane, *Lancet*, May, 1877.

zation. The original stock was from the secretion of an infecting chancre.

The pustules became transformed into quite large ulcers. Two of them felt hard, but in most of them there was not a trace of induration. At a little distance from some of the sores a small, somewhat tender glandular enlargement was noticed.

January 27th.—All the ulcers healing. Two of the largest were seated upon a hardish swelling, which was pretty well defined and felt like the half of a little sphere. Four others were somewhat hard, but not so well defined.

February 7th.—She had fever and redness of the tonsils, with a whitish exudation. Meantime the ulcers healed, leaving brown scars, while the cicatrices of the two which had been most indurated were somewhat hard.

April 23d.—In the right axilla a swollen gland could be felt, which was hard, movable, and not tender.

24th.—There appeared on the abdomen several isolated pustules, the size of a flax-seed, with red areola.

29th.—The pustules had increased in size and number. One or two glands were also perceptible. She had headache, especially toward evening. (Bidenkap.)

Boeck and Bidenkap did not consider the symptoms in this rather anomalous case as syphilitic, but Köbner and others regarded them as undoubtedly such. Bäumlér, a most decided dualist, looks upon this case as furnishing all the requisites of a mixed chancre. This example is a very interesting one from my point of view. Here are pustules, made with pus from a syphilitic person, the majority of which, owing to the purulency of the secretions used, present the characteristics of the soft sore only; but a few others assume the features of the hard sore, with constitutional syphilis as a result. I can account for the hard sores only on the supposition that a few white blood-corpuscles were mixed with the secretions, or that the matter in these few instances was not of sufficient intensity to secure a complete suppuration. In another case mentioned by the same observer, and in three cases related by Bumstead, pus from persons undergoing syphilization were inoculated upon others free from syphilis

without producing general infection. The case of Daniels-sen's is likewise particularly instructive here :

A man who had never had syphilis was inoculated with matter from a hard chancre. During five months previous he had been inoculated with pus of soft chancres, without syphilis appearing. From April 25th until the middle of September he had had two hundred and eighty-seven chancroids (soft chancres), after three hundred and ninety-three inoculations, and by the middle of September had apparently acquired immunity. On September 28th he was inoculated with new matter from an irritated ulcer, which later became indurated. In three days a characteristic pustule developed, and with pus from this inoculations were continued. But it was only possible to produce a few small pustules. In a short time the immunity was complete, and at the end of October all the ulcers had healed. November 15th a scar upon the right leg, where one of the former ulcers had been, broke open again and developed a shallow ulcer, with a thin secretion and hard edges. The inguinal glands were enlarged and indolent. January 5th, constitutional syphilis supervened.

Here we find a patient with the tendency to suppuration already exhausted ; so that, when the matter from the new irritated hard chancre was used, it is to be presumed that the suppuration was not very profuse, as shown by the fact that the first series could no longer be inoculated, and that the second produced a few small pustules only. These are just the conditions under which we should expect syphilis to follow the soft sore—when the syphilitic irritant ceases causing a suppuration profuse enough to convert all the white blood-globules into pus-corpuscles. In the instances where non-syphilitic persons have been inoculated with the secretions of auto-inoculated hard chancres, and have escaped infection, their immunity is not due to any modification of the syphilitic virus from having passed through the body of one already diseased, but because of the pathological law that suppuration is incompatible with infection. But the most instructive cases that I can adduce in my support are the ones already quoted in Part I. of this article. In them we find that patients in

the primary stage—second incubation—could be inoculated with the unirritated secretions of their own infecting (hard) chancres, with the result of producing, after long incubations, characteristic syphilitic papules, accompanied by characteristic adenitis, while inoculations made from the same infecting chancres, but which had been made to suppurate profusely by irritation, were followed without incubation by typical soft sores with the faculty of being propagated in kind, and not causing syphilis upon being inoculated on virgin soil. These last-mentioned ulcers could not have been Clercian chancroids, as I confidently believe they were inoculated when the patients were still free from general contamination.

It has been thought that certain experimental inoculations, made by Pick, and later by Kaposi, would seem to show the non-identity of the chancrous and chancroidal poisons. The former took non-specific pus, and, after failing to inoculate it upon the donors, introduced it under the skin of persons with general syphilis, and got as a result pustules which appeared without incubation, and which were inoculable in generations.

Kaposi found that non-specific pus could be inoculated upon the donors as well as upon other non-syphilitic persons, and that pustules were produced with the usual features of the chancroid.

These experiments merely prove that pus or other irritants are very apt to cause suppuration in the subjects of constitutional syphilis; and further that simple pus, under certain rare conditions, may produce corroding, inoculable sores on persons free from syphilis. But, while it must be admitted that non-specific pus may act in this manner, we find that syphilitic virus produces both hard and soft sores—chancres and chancroids. Thus in the hands of the Palatinate surgeon undoubtedly syphilitic virus caused only chancroids; and in one of Boeck's cases soft sores produced on a woman free from syphilis, by inoculation with secretion from an infecting chancre, could be inoculated in generations as in the chancroid. Again, matter from a single hard chancre produced in the same person both hard and soft sores. It would therefore appear that the secretions of hard chancres and of secondary lesions will pro-

duce—*a*, hard sores, followed by general infection; *b*, soft sores, not followed by general infection. Whether the chancre or the chancroid follows the application of the syphilitic virus seems to depend upon three conditions: 1. The natural tendency to pus-formation in persons free from syphilis; 2. The well-known aptitude to pus-formation in persons laboring under syphilis; 3. The almost certainty, when the purulent secretions of irritated syphilitic lesions are used, of causing soft sores—although in some cases, when irritated secretions are employed, certain of the sores thus produced may be soft, and others on the same person hard, or first soft and later becoming indurated (mixed chancre).

PART III. SUGGESTIONS FOR THE TREATMENT OF SYPHILIS.¹—As a logical result of the views which have been expressed in the pathology of syphilis, it has long seemed to me that an early extirpation of the enlarged lymphatics contiguous to the initial lesion would in some instances serve to avert constitutional disease. This would certainly be, to say the least, as legitimate an operation as excision of the chancre itself, which is looked upon favorably by some excellent authorities, although, even from my standpoint, I would regard this latter procedure as generally unavailing for reasons already given. By writers such as Lee, Lancereaux, and others, who do not deny that the syphilitic virus is carried to the glands by the lymphatic vessels, this operation might still seem to be justifiable, as depriving the blood of one of its sources of infection. While not bearing directly on the subject, but still of interest in this connection, we find Niemeyer writing that “it is quite possible that, at no distant day, the danger of pulmonary tubercle, which the presence of the cheesy residua of enlarged glands produces, will take a place among the indications for the extirpation of peripheral lymphatic tumors.” It would be advisable to remove enlarged lymphatics following the initial ulceration at the earliest period practicable, when they had just begun to indurate, and only in places fa-

¹ See my article in the *St. Louis Medical and Surgical Journal*, May, 1872.

avorable to surgical interference, as for instance in the groin. Even admitting the theory to be correct, that the virus is localized for a time in the glands near the point of lesion, I do not for a moment wish to say that their enucleation would in all instances be practicable. If the diagnosis were uncertain, or if the patient came for consultation some time after glandular induration had occurred, it would be manifestly improper to interfere. Again, if it be admitted that lymphatic glands remain as foci of infection, and Lee thinks that reinfection is possible only when all glandular engorgement has disappeared, it would not be bad practice to remove them. In conclusion, I wish to say that what I have written in this section of my article must be looked upon merely in the light of suggestions, and the failure or success of the operative measures advocated, for very manifest reasons, should not militate against the theories we have been considering.

NOTE.—In the discussion that followed the reading of this paper, Dr. Hyde remarked that the question regarding the lymphatic system, as that by which infectious material was introduced into the blood-mass, had passed from the domain of speculation and theory, and was an accepted and established proposition. Were other evidences wanting, the recently-published experiments of Reynaud, reported to the French Academy, were sufficient to settle that question. Reynaud produced horse-pox by inoculation, and when the vesicles were fully developed he laid bare a lymphatic vessel passing from the site of the lesion, opened it, established a lymphatic fistula, injected it into the jugular vein of another horse, and after a due period of incubation had the satisfaction of seeing the second animal covered with an eruption of horse-pox vesicles.¹

The gratifying results claimed by Auspitz² for the excision of the initial syphilitic sclerosis would seem to substantiate much that has been stated in this paper. Accumulating proofs show that in many instances thorough excision of the primary induration serves to avert constitutional infection; but I am still convinced that fewer failures would occur if the indurated glands themselves were extirpated, whenever the operation was practicable, and that at any period of the disease this procedure would undoubtedly modify the general affection.

¹ For further particulars in regard to this experiment, consult *Le Progrès Médical*, June 23, 1877, and *L'Union Médicale*, July 7, 1877.—W. A. H.

² "Zur Pathologie der syphilitischen Initial-Sclerose," *Vierteljahresschrift für Dermatologie und Syphilis*, 1877.

ART. III.—*Pathological Importance of Uric Acid and its Combinations.* BY F. P. MANN, M. D., Brooklyn.

It is well known that the nitrogen arising from tissue disintegration and the food is removed from the system principally through the kidneys and skin, the kidneys eliminating about five-sixths of the whole, viz., that portion which assumes the form of urea, uric acid, and its combinations.

The scope of this paper permits merely a glance at the chemical relations of these nitrogen compounds, which play so important a part as excrementitial products of vital chemistry. Urea may be formed by the transposition of cyanate of ammonia $(\text{NC}_2\text{H}_3\text{O}_2)\text{NH}_3$; it is further formed by decomposition of uric acid, of alloxan, alloxantin, etc. By heating slowly, urea separates first into ammonia, water, and mellanuric acid, which may be considered as a paired compound of urea with cyanic acid; when more strongly heated, cyanurenic acid remains, which is finally transposed into hydrate of cyanic, and is again united with the ammonia which has gone over to form urea. If we expose hydrochlorate of urea to a temperature of 140° , we obtain chloride of ammonium and pure cyanurenic acid. Further, if urea be warmed with dilute acids and alkalies, it separates into carbonic acid and ammonia.

The chemical composition of uric acid is $\text{C}_{10}\text{N}_4\text{H}_4\text{O}_6$, $\text{C}_2\text{H}_4\text{N}_2\text{O}_2 + 2\text{C}_4\text{NO}_2 = 168$. It may be considered as a paired compound of urenemid, with $\text{N}_2\text{C}_6\text{O}_4 = (\text{NC}_2\text{H}\text{---})\text{NH}$ with $\text{N}_2\text{C}_6\text{O}_4$; further, $\text{N}_2\text{C}_6\text{O}_4$ contains the elements of two atoms of cyanogen, and two atoms of oxatylous acid. If urenemid absorbs the elements of two atoms water we obtain urea, and if the elements of four atoms water with two atoms oxygen are united to $\text{N}_2\text{C}_6\text{O}_4$, alloxan is formed.

The above is sufficient to show the close chemical relation existing between uric acid, oxalic acid, and cyanogen compounds. The elements of urea are not only related to those of carbonate of ammonia, but are identical with those of cyanate of ammonia with water, "a circumstance," remarks Dr. Golding Bird, "which explains the occasional occurrence of cyanogen compounds in the urine."

The ready conversion of uric into oxalic acid under the influence of oxidizing agents has been proved by Profs. Liebig and Wohler; we have evidence of this in the disease known as oxaluria.

In a large proportion of cases where deposits of uric acid have appeared for any considerable time in the urine, oxalate of lime will be found either to replace this deposit, or to be alternated with it.

When we remember the characteristic instability of nitrogen compounds, and observe how easily, by a slight rearrangement of their component elements, they may be converted into compounds differing from those produced by the vital chemistry of health, it would seem reasonable to attribute a share of the blood-poisoning which occurs in disease to decomposition of nitrogenized products. The rapid tissue disintegration that takes place in acute fevers, and sthenic disorders in general, results in the accumulation of *materies morbi* in the blood, especially as the skin and depurating organs are ordinarily not in sufficiently active operation either prior to or during their progress; consequently, we find the urine, in the course of such diseases, loaded with excrementitious material, affording deposits of uric acid and urates. Confining our attention to the organs chiefly concerned in the elimination of tissue-waste, which assumes the form of urea, uric acid, and its combinations, we propose to consider briefly the effect produced upon the kidneys and urinary tract by the continuous elimination and transmission of an abnormal quantity of such material, together with the altered condition of the urine, with which it is associated. We hold it to be characteristic of all mucous membranes, and secreting surfaces generally, that an abnormal condition, either of the secretion that bathes their surfaces, or of the fluids destined to pass over them, will produce irritation and inflammation just in proportion to the amount of such change, and the length of time it continues. Witness the inflammation and often ulceration of the mucous membrane of the mouth when the saliva continues abnormally acid, or that of the Schneiderian membrane, and even the skin surrounding the nostrils, caused by the watery mucus so freely secreted during an attack of influenza, or the painful

disturbance of stomach and digestive organs from excessive acidity, and, above all, the serious results to the kidney and urinary tract that follow continued change in the normal characteristics of the urine. But it will be said of these deposits of uric acid and urates that they are of common occurrence in a condition of apparent health, and hence can have no pathological significance. It is true that these deposits may and do appear transiently, as a result of malassimilation of food, or sudden check of perspiration, disappearing after a few hours without occasioning noticeable disturbance; or whenever, by natural efforts of the organism, the balance between tissue disintegration and depuration is restored. It is not true, on the other hand, that the accumulation of effete nitrogenized material, which invariably attends such deposits, can go on from day to day without producing more or less disturbance of the system generally, and of the kidneys and urinary tract in particular, coupled as this condition is with abnormally-acid urine, of high specific gravity, loaded with crystallizable and non-crystallizable material. The microscopical examination of these sediments, whenever they have continued for any considerable length of time, discloses crystals of uric acid and amorphous deposits of urates mingled with masses of renal and vesical epithelium. This positive proof of irritation may not be accompanied by any very marked symptoms, for, as is well known, the early stages of desquamative nephritis may exist without giving warning of its presence by outward symptoms. In fact, most cases of Bright's disease are considerably advanced before medical assistance is procured, so that it would seem puerile to assert, in face of such facts, that an abnormal condition of the blood and urine has no pathological significance, because unattended by immediate evidence of a departure from health. We ask attention to this point, and suggest that those who will take pains to inquire carefully into the history of cases of all forms of nephritis, nephralgia, and cystitis, acute and chronic, will be convinced that there exists a direct connection between the condition of the blood and highly-acid urine, which gives rise to deposits of uric acid and its combinations, and the subsequent development of inflammation, renal or vesical. Drs.

Van Buren and Keyes ("Genito-Urinary Organs") remark: "The main causes of nephralgia are very acid urine, kidney-stone, organic kidney-disease, pyelitis, cancer, and any morbid deposit, etc. Over-acid urine is in itself a *sufficient* and not *unfrequent* cause. The urine in health is slightly acid, especially after fasting. As a rule, however, in the healthy state, there is an alkaline tide (as Roberts has demonstrated it) to the urine, which comes on after each meal, and lasts several hours. The heavier the meal, the more lasting the tide. In the morning, with American habits of living, it occurs about half-past ten."

The urine, then, shortly after breakfast should be normally neutral, or even faintly alkaline, and, when it is not so, a diagnosis of over-acid urine may be safely made. When this leads to a *deposit of free uric acid*, the sharp-pointed crystals mechanically scrape or irritate all portions of the mucous membrane. The urine may be over-acid, while its true character is marked by some bladder or kidney inflammation, which furnishes enough volatile alkali to neutralize the whole flow. This source of error has constantly to be guarded against. There are no inflammatory conditions, acute or chronic, of any portion of the urinary passages, which are not distinctly aggravated by over-acid urine, while some of them are caused in the first instance by it. Hence it becomes a part of the hygiene of the urinary passages, to see that the alkaline tide exists say at eleven o'clock in the morning, and, if it does not, to cause it to do so, by attention to hygienic laws, and the internal administration of a suitable alkali. In all cases of nephralgia, where careful examination fails to detect any tumor of the kidney or any disease of the bladder or prostate, suspicion should fall at once upon an over-acid state of the urine, as being the cause, or possibly retained kidney-stone, with pyelitis, etc. The same authorities, when speaking of the causes of neuralgia of the vesical neck, remark: "Second to the sexual cause comes the arthritic or gouty diathesis, that general blood condition attended by acidity and concentration of the secretions and local congestions, so often of the tegumentary structures with neuralgic and irritable habit." Hassall ("Urinary Disorders") remarks: "Urine depositing uric acid

is usually somewhat high-colored, possessing a deeper tint than natural, and of considerable specific gravity, always acid, and frequently containing such an excess of urea that, on addition of nitric acid to a little urine in a watch-glass, crystallization obvious to the naked eye ensues, resulting from the formation of nitrate of urea. The first situation in which uric acid may be deposited from the urine is in the lobules of the kidney. The crystals may be washed away from this situation by the urine; or, as frequently happens, they may be formed in the renal tubules in connection with the escape of albumen and be thrown off impacted in albuminous casts; or, lastly, uric acid may accumulate in the lobules to such an extent as to form renal calculi. The second situation in which uric acid may be deposited is in the bladder. After its precipitation in this viscus, it may be voided wholly, or in part, as a sand-like deposit. When not wholly discharged, it is apt to accumulate in the bladder, giving rise to vesical calculi." In other words, from blood unduly charged with nitrogenous elements of tissue disintegration is eliminated over-acid urine from which are deposited such compounds as uric acid and urates; this condition of blood and urine predisposing to various forms of renal and vesical irritation. Aware that the pathological importance of uric acid and its combinations for which we are contending is not recognized by many even prominent specialists, we shall offer no apology for supporting our views by still further authority. Dr. Copeland (article on "Uric Acid," "Medical Dictionary") says: "The influence of an insufficiently depurated blood, of effete materials circulating in the blood, owing to impaired function of either the kidneys, the skin, or the intestinal mucous membrane and follicles, or of two or all of these, or to imperfect compensation of function of the others when one is impaired or interrupted, in causing diseases not only of a serious and acute character, but also of a chronic and obstinate kind, is well known. In acute rheumatism, gout, fevers, diseases of the liver, spleen, etc., the elements and sources of uric acid and its compounds are abundantly supplied by states of the blood to the kidneys; and uric acid, both free and combined, is greatly in excess in the urine. The crises of fevers and in-

flammatory diseases are merely the returning functions of depurating organs, and the free discharge by these emunctories of effete nitrogenous elements and materials and their compounds, chiefly by the kidneys, bowels, and skin. One of the most important and most generally prevalent of these conditions, more especially when these materials are deposited in large or unusual quantities, and still more particularly when they are deposited in any of the urinary organs, is depressed or exhausted organic nervous power. Uric acid and its combinations have been attributed to two sources, viz., the waste or disintegration of tissue, and nitrogenized food, but it appears to me that too large a share of these sources has been imputed to the former (which is more correctly the nutritive metamorphose) while the waste and metamorphosis of blood-globules, fibrin and albumen of the blood, as contributing to the formation of these substances, have been overlooked." This accumulation, waste, and decomposition of nitrogenized material in the blood, imply increased chemical action, molecular motion, and the consequent development of heat. Accurate thermometrical observations will disclose the fact that these deposits and the correlated blood-disorder are attended with increase of temperature. We find, in accordance with this, the highest range of temperature in sthenic diseases—pneumonia, pleurisy, active fevers, acute rheumatism, etc. With this accumulation of effete material there occurs an acid state of the secretions generally; owing, probably, to the formation of excess of acid phosphate of soda in connection with uric acid, to the former is attributed by most authorities the normal acidity of the urine. Finally, we claim that uric acid and its combinations are of pathological importance as showing abnormally rapid tissue-waste or the accumulation of its products in the blood from deficient action of depurating organs, also because of its great insolubility and liability to crystallize, thus obstructing the urinary passages, besides offering a fruitful source of mechanical irritation; also on account of the highly-acid urine which accompanies this condition; itself a cause of frequent disturbance to the whole urinary tract.

With regard to remedies, tissue-waste may be greatly reduced in fevers and inflammatory disorders by promptly

controlling pulsation and respiration, and *veratrum viride* is perhaps the most efficient remedy for accomplishing this purpose. The alkaline remedies are, as is well known, indirectly solvents of uric acid; that is, their bases combine with it, producing compounds which are more soluble than the uncombined acid. In rheumatism it sometimes happens that the alkaline treatment disappoints; often in such cases the administration of sulphate of potassa in drachm-doses two or three times per day, either alone or in combination with bicarbonate of potassa in equal quantity, or sufficient to completely neutralize acidity of the urine, will succeed. This may be explained upon the ground that rheumatism sometimes depends not upon formation of urate of soda, but upon a biurate of magnesia, which is thus rendered soluble by conversion into a sulphate of that salt. Another remedy worthy of especial notice in removing the nitrogenized products of tissue-waste is benzoic acid; itself destitute of nitrogen, it combines with nitrogen derived from nitrogenous substances contained in the blood, which would otherwise go to form urea and uric acid, and is itself converted into hippuric acid, a substance rich in nitrogen. In rheumatism, either alone or combined with bicarbonate of potassa, which is a convenient solvent, forming benzoate of potassa, administered in the proportion of ten grains of the acid to one drachm of the salt given every four or six hours, it will often control the local inflammation, especially the subacute form, when other remedies have failed; it probably acts by converting the urates and biurates into more soluble hippurates.

This question of tissue disintegration and the formation of nitrogen compounds in the blood has to do in its last analysis with elementary matter in a nascent state; that condition of molecules vibrating with the peculiarly attractive energy they possess when suddenly released from the restraint of associations into which organic force has plunged them. We know but little of the laws by which they are governed at the moment of such separation. We know as little about the chemical relation which connects the plastic matters forming the web of the tissues with their products of destruction, urea, uric acid, creatine, cholesterine, and zanthine. We can place

no arbitrary boundary to the play of the forces inherent in elementary matter, especially in the vital laboratory, where organization and disorganization are continually maintaining a struggle for mastery. If this is true in a condition of health, its application in the presence of disease is undoubtedly still more cogent, when the depurating organs are no longer able to preserve the balance between tissue disintegration and excretion. In this connection the important researches of MM. Andral and Gavarret ("Essai d'Hématologie") have shown a deficiency of fibrine in malignant fevers, typhus, small-pox, scarlatina, etc. This deficiency may be small in the commencement, but, as the disease advances, it becomes greater, and when symptoms of putridity have manifested themselves, which may ultimately complicate all fevers, the loss of fibrine is very marked; and, further, the intensity of the symptoms is in direct relation to the loss of this important substance. May not this rapid destruction of fibrine, a compound rich in nitrogen, together with the waste of other nitrogenous material, account, in some measure, not only for the great prostration of vital energy so strongly marked in contagious diseases, but also for the blood-poisoning, the germinal matter upon which such disorders are believed to depend acting merely as a ferment? Whether this be true or not, the effect produced upon the kidneys by this condition of the blood is illustrated in scarlatina and typhoid fever by the frequency with which organic disease of these organs follows an attack of either; in both, the blood and urine are loaded with excrementitious material. From this point of view it becomes of the first importance in fevers, and all forms of inflammatory disorders especially, to establish and maintain thorough action of the depurating organs by the administration of such remedies as will aid in relieving the circulation of its nitrogenous load, and at the same time favor the perfect solubility of its saline constituents, by preventing the possibility of their being converted into more or less insoluble urates and biurates, from excessive production of uric acid. We venture to suggest that close attention to the condition of the urine and kidneys, during scarlatina and typhoid fever, will go far toward protecting these organs from subsequent disease.

ART. IV.—*Traumatic Cerebral Pachymeningitis*. By J. C. SHAW, M. D., Member of the American Neurological Association, and Physician to Department for Diseases of the Mind and Nervous System in the Central Dispensary, Brooklyn.

THE cerebral and spinal dura mater are liable to a variety of pathologic changes, which, for the most part, have a symptomatology of their own, and are capable of diagnostication. We have gummatous pachymeningitis, pachymeningitis hæmorrhagica, and simple pachymeningitis, which may be purulent or not. The simple form of pachymeningitis has for its cause irritation from growths in the cranium, and alcoholism; but more especially traumatism and disease of the cranial and spinal bones. In diseases of the middle ear, leading to necrosis of the temporal bone, and in primary diseases of the mastoid cells, where the necrotic process becomes quite extensive, the adjacent dura mater becomes the seat of an irritative proliferous process, more or less extensive, and which by contiguity may lead to abscess of the brain.

In extensive fracture, with or without subsequent necrosis, but especially with subsequent necrosis, we are liable to have pachymeningitis; but it will be my purpose to consider a form of pachymeningitis due to traumatism where there is no fracture.

CASE I.—J. O. G., male, aged fifteen years, a patient referred to me from the Brooklyn Eye and Ear Hospital, February, 1877.

In July, 1876, he fell from a tree, striking the left side of his forehead, just above the orbit, on the curb-stone. He was temporarily stunned. There was extensive extravasation of blood into the surrounding tissue, but there was no tearing of the skin; the forehead and lids became quite swollen, so that he was unable to open his eyes for several days.

Ever since, he has had some pain in the head of a dull aching character, which is continual; and recently, at times, has severe attacks coming on paroxysmally and lasting about twenty minutes, and which are characterized by severe pain of a sharp, lancinating character, darting from forehead to

occiput. He has attacks of this kind as often as five times a week.

In January of this year, when he began to go to school, he first noticed that he had some defect of vision.

Has never had vomiting, nausea, or dizziness. Sleeps and eats well, and there are no other symptoms present.

Examination of the forehead, where he was injured, shows that the skin has been at some time contused, but there is no roughening or depression of the bone. The boy is of slight physique, and quite small for his age.

Vision was found to be $\frac{20}{30}$, both eyes, and ophthalmoscopic examination showed commencing but decided atrophy of both optic nerves. This patient presented himself at the hospital on account of his commencing defect in vision; the other symptoms above detailed were not mentioned by him until I questioned him as to headache, and then he gave a very clear description of his pain and the character of it, but evidently had not considered that it had the least connection with his defect of vision.

CASE II.—S. M., male, aged thirty-three years, referred to me from the Brooklyn Eye and Ear Hospital, Sept. 20, 1875. This patient also presented himself for defect of vision. He is a man of very large physique, and for years has been dreadfully addicted to alcoholic intoxication. In one of his debauches he fell, and struck the back of his head on the left side, about the region of the occipito-parietal suture. The only symptoms which this patient presented were impaired vision and a very intense diffuse headache, with paroxysms of lancinating pain. The ophthalmoscope showed marked atrophy of both optic nerves, which was so great that there was only perception of light. An examination of the skull showed a slight thickening of the scalp, but no depression or apparent thickening of the skull underneath. This patient continued in this condition, and died in the fall of 1876, rather suddenly, without our knowing of it, so that no *post-mortem* was made.

CASE III.—Referred to me by Dr. Sherwell, February 5, 1877. A. G., aged eighteen, a healthy-looking boy of fair size. Three weeks ago he slipped on the ice and fell while carrying a heavy basket of groceries, striking the back of

his head with considerable force on the sidewalk. He was stunned temporarily. Ever since, he has complained of pain in his head of a rather intense character, mostly behind, and on the convexity generally, which pain has been gradually growing more severe, preventing him from sleeping at night, so that he is becoming quite pale and losing his appetite. Has no dizziness, nausea, or vomiting, no impairment of vision, and there are no abnormal ophthalmoscopic appearances. Examination of the skull in the region where he struck shows nothing whatever abnormal, and there is no pain on pressure. There are no other symptoms present.

These three cases serve to illustrate a way in which simple pachymeningitis is brought about, and which appears not to be generally recognized.

The symptomatology in these cases is very brief; it is comprised in headache, and subsequent atrophy of the optic nerves. Headache is such a common thing that none of these patients appear to have taken special notice of it, or had an idea that it could possibly have a connection with the impaired vision, which to them was the real disease.

Headache is a symptom which undoubtedly has a variety of pathologic conditions for its basis. In these cases, however, the pain is of a peculiar character; it is a continual, or almost continual, dull aching, diffuse generally, interspersed with paroxysms of neuralgic-like pain, sharp, lancinating, stabbing in character, which is usually described as traveling with lightning-like rapidity from one side of the cranial vault to the other, many such paroxysms occurring in the day, but sometimes being absent for several days.

There is no probability of mistaking these pains for true neuralgia of the fifth nerve, or for hemicrania.

This headache may, however, possibly be present in hæmatoma of the dura mater; but we have some differential points between hæmorrhagic pachymeningitis and the simple form of pachymeningitis which I am describing. In this simple variety it occurs at all ages. Two of these three cases are eighteen years old; there is atrophy of the optic nerve after a short time—three to six months—and there is always a history of traumatism. Hæmorrhagic pachymeningitis is confined to the

middle and advanced period of life, and is much more unfrequent, and atrophy of the optic nerves is not one of its complications, especially as hæmatoma almost always occurs on the convexity; and if it did occur at the base we would be more apt to have "choked disk."

The etiology in these cases is clear.

Pathology.—We have in these cases a simple pachymeningitis. The macroscopic appearances are thickening and cloudiness of the membrane, most marked at the seat of primary disturbance, and presenting different degrees of intensity in different parts of the dura, and being more or less general according to the length of time the morbid process has been going on. The cloudiness is quite marked along the course of the vessels, and the periosteal layer presents an unusually roughened surface, as it is here that the morbid process begins. Sections of the dura placed under the microscope show an immense increase of nuclei, most marked at the external layer of the dura and around the blood-vessels. The lesion in the optic nerves is probably, in these cases, due to pressure of the thickened dura on its delicate structure, this nerve suffering much more quickly from interference with its nutrition than any other nerve in the body.

In the case of the boy (Case I.), the morbid process began in the dura covering the frontal bone, and must have extended itself along the floor of the skull and around the optic foramina, causing constriction of the nerve-tubes as they pass through that opening. To have atrophy of the optic nerves, the pachymeningitis must be more or less general, and have involved the basal dura.

In a case of pachymeningitis, which I saw through the kindness of my friend Dr. Westbrook, due to a fracture of the frontal bone, in a boy about sixteen years old, from the kick of a horse, the pachymeningitis, which had become quite diffuse when I saw the case, had traveled along the floor of the skull backward, and interfered with the optic nerves, causing complete atrophy of both of them. In this case there was also anosmia on the side of fracture, due undoubtedly to the interference with the olfactory nerve by the thickened dura.

It is now a well-known fact that the inflamed dura is very sensitive; hence the peculiar sharp, lancinating pains which are present in these cases.

Many years ago cases were reported of what was then called reflex amaurosis, due to injury of the frontal nerve; it appears quite probable that these were cases of cerebral pachymeningitis, like my Case I., which at that time would probably have been put under that head.

The treatment in these cases consists in brisk counter-irritation behind the ears and neck, by cantharidal collodion or the actual cautery. Internally, ergot and iodide of potassa.

When the condition has gone on for a very long time, and complete atrophy of both nerves has occurred, the probability of an improvement is very small, even for the pain in the head. Certainly no regeneration of the optic nerves can be expected. In the recent cases much may be done.

In Case I., the headache was almost entirely gone when I last saw the patient, and the atrophy of the optic nerves had not progressed.

Case III. being very recent, no atrophy had yet occurred, and the pain in the head was entirely relieved.

The very grave lesions of the optic nerves in these cases demand the earnest consideration of the physician, as a nerve once seriously injured dooms the patient to life-long blindness.

Clinical Records from Private and Hospital Practice.

I.—*Cases of Nævi treated by Electrolysis.* By GEORGE M. BEARD, M. D.

THE following cases illustrate what can be done by electrolysis in the different varieties of nævi—those on the skin, those in the skin, and those beneath the skin.

CASE I. *Cutaneous Nævus (Port - Wine Stain) on the Forehead; Approximate Cure after two Operations by Electrolysis.*—A little girl, four years of age, had a congenital nævus,

a port-wine stain, that disappeared for the moment on pressure, in the middle of the forehead. The deformity was one inch long and half an inch wide.

April 8, 1875.—I operated with ten cells for the minute, using both poles in the skin. The patient was anæsthetized by Dr. Sterling. After the operation the spot was black and raised somewhat; some suppuration followed, and, when the scab dropped off, a small triangular portion of the stain remained; that was operated on July 7, 1875.

At the present time but little of the stain is to be seen; this can be removed at another operation. There will, however, probably be something of a scar for years to come.

I mention this case because it belongs to the form of nævus that is hardest to treat by electrolysis. To treat cases of this kind so as to leave but a moderate scar is a great success.

In other forms of nævi the cure is oftentimes absolute.

CASE II. Small Superficial Nævus of the Nose; Electrolysis; Complete Disappearance.—An infant, a few months old, had a small nævus on the bridge of the nose, superficial, that is, raised somewhat above the level of the skin, and of the size of a small pea.

The usual treatment, by injections of persulphate of iron, had not been satisfactory.

December 8, 1875.—I operated by electrolysis, using only the positive pole in the tumor. The child was fully anæsthetized by Dr. Burge. The operation lasted about seven minutes only, a mild current being used.

Six weeks after the operation, a portion of the tumor, of the size of the head of a pin, remained; this in time disappeared.

It is better in cases of this kind to have a trace of the tumor remain for some time, with probability of ultimate disappearance, than to operate too long with too strong a current, and thus excite great suppuration. Moderate suppuration is not necessarily a bad result, and may not be followed by scarring.

CASE III. Nævus on the Lip; Electrolysis; Quick Disappearance of the Tumor.—An infant, less than one year old,

a child of Mr. N., was referred to me by Dr. Whittingham, of Milburn, N. J. The patient was disfigured by a number of nævi, one on the ear, another on the cheek, another on the nose, and another still, of the subcutaneous variety, on the upper lip. Those on the face were of the cutaneous variety, and were treated with encouraging results by Dr. Whittingham, with collodion.

July 2d.—I operated on the subcutaneous tumors, the child being fully anæsthetized by Dr. Emerson. I used at first the positive pole only on the tumor, but in the latter part of the operation I used both poles, but only for a short time in one place, and with a mild current. The entire operation lasted about ten minutes; but the result might, with a stronger current, have been accomplished in a shorter time. At the close of the operation, and even before the close, the tumor was hard and had changed in color, as usual, under the electrolysis.

CASE IV. *Cutaneous and Subcutaneous Nævus on the Forehead; Electrolysis; Recovery, with a Small Scar.*—A child, fourteen months old, had a cutaneous nævus on the forehead, of the size of a five-cent piece. Although on the skin, it also extended beneath the skin somewhat, and did not belong among the port-wine stains.

June 25, 1877.—I operated twelve minutes, using only the positive pole, with an uninsulated needle in the tumor, which, under the action of the current, readily became hard and dark. No unpleasant effects followed, and no suppuration.

When last seen, in March, it was evident that the destruction of the tumor was complete. There was yet discoloration, and no doubt will be for many months. I believe that, when the child reaches the age of discretion, if not before that time, the scar will be little, if at all, noticeable.

In ten days nearly all trace of the tumor had disappeared. The rapidity of the disappearance I attribute to the thinness of the skin over the tumor. The needles were not insulated, and the surface was acted on somewhat, as I desired, but not sufficient to cause suppuration.

In this case I operated, judging by the results, just long

enough. A longer and severer operation might have produced a scar; a much shorter operation might have failed to obliterate the tumor, and required repetition; indeed, I expected that it might be necessary to operate again. In all these cases it is well to be on the safe side—to do too little rather than too much.

Parents and friends are frequently afraid of anæsthetics for their infants. This fear does not seem to be founded on any evil effects, certainly no fatal effects from anæsthetics, either chloroform or ether, when given to infants. Babies seem to bear anæsthesia better than adults; they do bear electricity well, even when the applications are made on the head and face.

Notes of Hospital Practice.

CHARITY HOSPITAL.

SERVICE OF DR. EDWARD FRANKEL.

Anchylosis of Shoulder-joint following Operation for the Relief of Dislocation upward of Acromial End of Clavicle; Excision of Shoulder-joint.—E. C., blacksmith, aged forty years, was admitted into the hospital in June, 1877, suffering from firm fibrous anchylosis of right shoulder-joint, which caused complete uselessness of the right upper extremity. The following history was elicited: In August, 1876, he fell from a ladder, and, striking upon his right shoulder, sustained a dislocation upward and backward of the outer end of the clavicle from the acromion process. The usual treatment by rest, compression, and strapping, seems to have been followed, and the patient states that at the end of six weeks he had perfect use of the whole extremity, with the exception of a weakness across the point of dislocation. The reduction, however, was not complete, as the patient, in January, 1877, came under the care of a prominent surgeon of Philadelphia, who proposed and performed an operation which, according to the

intelligent account of the patient, was an attempt to bring about osseous union between the two bones by keeping them in apposition until such union had taken place. The pegs introduced were retained for ten days. Acute inflammation followed, and suppuration continued for several months, at the end of which time the patient was unable to move the arm from the side in any direction.

On admission, the patient gave no history of previous disease, and presented the appearance of perfect health, with strong muscular development. The right arm was firmly bound down to the thorax, and the patient had much difficulty in bringing his fingers up to his mouth. The right deltoid muscle had undergone slight atrophy. Over the acromioclavicular articulation was found the cicatrix of an incision about three inches in length, and a small sinus leading downward about half an inch. The external end of the right clavicle was found dislocated upward and backward one inch and a half from the acromion, and could not be reduced to its normal position. It also appeared shortened, as if a small portion had been removed in the previous operation. The head of the humerus was found firmly adherent to the scapula, and three attempts to break up the adhesions under anæsthesia were ineffectually made. Excision of the head of the bone was decided upon, and performed August 8th by the longitudinal incision. Some difficulty was experienced in breaking up the adhesions, which were extremely tough, requiring the assistance of the knife. The head of the bone was removed to about one inch below the greater tuberosity, and the lower angle of the wound was closed by three sutures, and healed by first intention. The deep wound also showed tendency to close with extreme rapidity, but was kept open for about six weeks. At the present date the wound has entirely closed, and, under the influence of frequent passive motion and the application of electricity to the deltoid muscle, the patient is now able to move the arm forward and backward, adduct it to an angle of sixty degrees from the body, and promises within a short time to have full use of it.

Clinical Reports of the Demilt Dispensary.

DEPARTMENT OF DISEASES OF THE SKIN.

BY DR. ROBERT CAMPBELL.

CASE I. *Purpura Rheumatica (Peliosis Rheumatica)*, treated by the Internal Administration of Ergot.—Bernard R., a native of the United States, thirty years of age, had rheumatism some time during the year 1875. About three weeks after the commencement of the rheumatic attack, and when it was at its worst, an eruption made its appearance on the forearms, thighs, and legs. This consisted of a number of petechiæ, which, when they first appeared, were of a bright-red hue, gradually becoming purple, then yellowish-brown, and finally fading away entirely, to be succeeded by a new crop. In some places these points of eruption were very small in size, while, where the rheumatic pains were severest, as at the inner side of each ankle and over the gastrocnemii muscles, large blotches existed, resembling, in a great degree, ecchymoses. At that time the eruption disappeared, under rheumatic treatment, in about a month after its first appearance.

About April 1st of this year the patient had another attack of rheumatism, when the skin-affection again made its appearance, and remained until he came under my care.

May 7th.—The patient presents a pallid and cachectic appearance. His lips, gums, and tongue, are of a livid hue.

The eruption is situated on the inner and anterior surface of both forearms, and on the buttocks, thighs, and legs. On the legs the disease exists on all surfaces, but to a greater extent on the posterior aspect than elsewhere. The dorsal surfaces of the feet are affected. The face, neck, trunk, hands, penis, scrotum, and plantar surfaces of both feet, are spared.

On the forearms the eruption is made up of a number of small hæmorrhagic spots, varying in size from that of a pin's point to a pin's head in diameter, mostly discrete, irregular in

outline, and very sparsely distributed over the anterior and inner surfaces in this situation. On the lower extremities, commencing at the crest of the ileum and extending over the buttocks, the petechiæ are about the same size and character as those seen on the forearms. The spots of eruption gradually increase in size toward the leg, in that situation varying from an eighth of an inch to about half the breadth of the palm of one's hand in diameter, being smallest over the tibia and largest over the gastrocnemius muscle; on the inner side of the ankle large blotches exist. In those places where the diseased patches are largest, as over the gastrocnemii muscles and at the inner side of the ankles, the rheumatic pains have been greatest. On walking very much, new points of eruption make their appearance.

The eruption is of a bright-red color when it first makes its appearance, gradually fading into a purplish, and finally into a yellowish-brown, before disappearing. At present the different shades of color peculiar to the disease are to be seen, viz., the bright-red, purple, and the yellowish-brown. These petechiæ and blotches do *not* disappear upon pressure; each crop remains out about three or four days before disappearing, and passes through all the different colors mentioned. New points of eruption are continually appearing.

In regard to the patient's general health, he says that his appetite is poor; that he eats sparingly of vegetables; that his bowels are regular, and that he sleeps well at night.

Ordered: \mathcal{R} . Extr. ergotæ fld., aquæ, āā, \mathfrak{z} ij. M. A teaspoonful in half a wine-glassful of water, every four hours. In addition to this, he was directed to drink lemonade and eat more vegetables.

9th.—There has been no new development of eruption since he was last seen. The different patches of disease that were of a bright-red color day before yesterday have faded, and now appear as faint stains; on the forearms the petechiæ have almost entirely disappeared. The patient says that he feels much better than at the last visit. Ordered to continue the same treatment.

11th.—Very great improvement. The eruption is steadily disappearing, and, with the exception of a few purpuric spots

on the legs, there has been no new appearance of the disease. Continued the same treatment.

14th.—Still improving. This was the last time that the patient came to the Dispensary, and, as the eruption was then rapidly disappearing, it is fair to presume that he ultimately recovered.

That this was a case of purpura, is shown by the peculiar nature of the eruption, consisting, as it did, of a number of petechiæ and blotches, not disappearing on pressure, at first of a bright-red hue, gradually changing to purple, then yellowish-brown, and finally disappearing, to be replaced by a fresh crop; the peculiar pallid, cachectic, and exsanguinated appearance presented by the patient, is also characteristic. As to its being of the rheumatic form, we have the history of the occurrence of a similar eruption when the patient had rheumatism, two years ago; of its recurrence during another attack of the same disease, and the eruption being worst where the rheumatic pains were severest.

As it is beyond the scope of this article to enter more fully into details in regard to the disease, I will refer my readers to papers on the subject by Kinnicutt¹ and Bulkley.²

CASE II. *Epidermic Favus in a Child Two Weeks Old.*—Nellie M., three weeks old. Her mother says that a pimple made its appearance on the right side of the child's abdomen when it was two weeks and two days old. Nothing definite can be ascertained as to the source of contagion.

June 25th.—At present the child, who appears to be in perfect health, has a patch of eruption half an inch in diameter, and circular, situated on the right side of the abdomen, immediately below the border of the last rib and to the inner side of its angle. The spot is of a bright-yellow color, resembling a piece of roll sulphur; the crust, which is about an eighth of an inch in diameter, is quite friable, and when removed leaves a denuded surface presenting a cup-shaped depression. On examining the powdered crust with the microscope, the

¹ Kinnicutt, "Peliosis Rheumatica." "Archives of Dermatology," vol. i., p. 193.

² Bulkley, "On the Use of Ergot in the Treatment of Purpura." *The Practitioner*, November, 1876.

parasite (*Achorion Schönleini*) is found to be present, consisting of a number of circular spores and long tubes, the spores predominating.

Ordered: R. Ungt. citrin., 3jss; ungt. simpl., 3ijss. M. To be applied to the eruption every night.

27th.—Very great improvement. The diseased spot has lost its bright-yellow hue, and, instead of the thick crust existing before, only a thin lamina of epithelium remains; on removing this thin film, the surface is found to have lost its cup-shaped depression, and to have assumed a natural appearance. Ordered ungt. simpl.

29th.—The eruption has entirely disappeared, leaving a perfectly healthy surface.

The features worthy of notice in this case are its occurrence in so young a person, and the body, which is comparatively free from the disease, being the part affected. The diagnosis can only be made *positive* in this, as in other parasitic diseases, by having recourse to the microscope and finding the parasite; our attention, however, should be called to the nature of the disease by the color of the eruption, the friable nature of the crust, and the peculiar cup-shaped depression left on exposing the surface of the skin.

CASE III. *Tinea Circinata*, marked by a rapid Development of the different Patches of Disease.—John Connell, three years old, has an eruption, which first made its appearance nine days ago, in the form of a circle on the left side of the face. He rubbed it greatly, causing it to spread, until it now occupies its present position.

June 11th.—On the face, thirty-five patches of eruption are to be found, and on the remainder of the body twenty-five are to be seen, making *sixty* in all that have made their appearance in the course of *nine days*. The eruption on the face is made up of circles, the border of each circle consisting of fine white scales, and the centres composed of healthy tissue. More of these patches of disease exist on the left than on the right side of the face. These circular patches are found on the forearms, and on the left side there is one spot with a vesiculo-pustular margin, probably due to the irritation caused by the clothes. At the symphysis pubis, on the centre of the dor-

sum of the penis, and near the middle of Poupart's ligament, the diseased patches are excoriated, and secrete a quantity of pus resembling to a certain extent the impetiginous form of eczema. On microscopical examination, the scales are found to contain an abundance of the *trichophyton*. The child's mother is also affected in a similar manner.

This case is narrated on account of the unusually rapid development of the disease, and because of its resembling, in some respects, an impetiginous eczema. As was stated in describing the previous case, no absolute diagnosis can be made without the aid of the microscope.

CASE IV. *Chronic Eczema, mainly occupying the Extensor instead of the Flexor Surfaces of the Body.*—Bridget McC., born in Ireland, forty years of age. She is married, and has had three children, all of whom are healthy. In the summer of 1872, five or six months after the birth of her last child, she noticed that a few pimples, or blisters, as she terms them, made their appearance on the left knee, and that the eruption gradually spread until it occupies its present position, except that, three years ago, the left popliteal space was affected, but is now free from disease. Her health is very good. Bowels rather constipated. Tongue coated. Menstruation natural and regular.

September 10th.—On the left elbow, *extensor surface*, is a patch of eruption half an inch by two inches, the longest diameter being in the direction of the limb. It has a badly-defined margin, is marked by fissures and excoriations, is of a dusky-red hue, and is covered with thin, loosely adherent, lustreless scales, which, when removed, leave a moist and exuding surface beneath. The skin is very much thickened, and itches greatly. A few furuncles exist on the forearm immediately below the ante-cubital space. The right elbow is spared. Over the left knee is another diseased patch, about one inch transversely and three inches in length; just below the left popliteal space the surface is marked by a narrow strip of eruption running across the leg. At the junction of the middle and lower third of the left leg is a small varicose ulcer. Over the tendo Achillis is another patch of diseased skin about two inches by three in diameter. The right knee is affected

similarly to the left. The eruption on all surfaces where it exists is marked by the same characters as that seen in the left elbow.

The internal treatment was: \mathcal{R} . Ferri et ammon. cit., \mathfrak{z} j; potass. acetat., \mathfrak{z} jv; sol. Fowleri, tinct. nucis vom., ãã \mathfrak{z} ij; tinc. gent. co., \mathfrak{z} j; aquæ, \mathfrak{z} ijss. \mathcal{M} . A teaspoonful in half a wine-glassful of water, three times a day, *immediately* after meals. Locally she was ordered not to wash the parts affected, and to apply the following: \mathcal{R} . Ungt. picis liq., \mathfrak{z} ij; ungt. zinci oxid., \mathfrak{z} vi. \mathcal{M} .

In this case we have a *typical* eczema attacking the *extensor* aspects of the body, contrary to the general rule, the flexors being the surfaces generally affected. The chief points of diagnosis are gathered from what the patient says as to the origin of the disease, viz., that it commenced in the form of pimples, or blisters; the itching, thickening of the skin, excoriations, and fissures; the ill-defined margin of the eruption, and the moist and *exuding* surface left on removing the scales.

CASE V. *Eczema and Psoriasis existing in the same Patient at the same Time*.—John S., born in Ireland, forty-five years old, and laborer by occupation. He says that an eruption made its appearance on his arms—the exact site of disease he does not remember—about three years ago, and gradually spread until it occupied the greater part of the body; it has never entirely disappeared, but he is generally freer from it during the cold weather than at other times. About one year ago a small patch of dry eczema made its appearance on the inner side of the left ankle, and, on being irritated, gradually spread, until it occupied a greater part of the leg.

June 28th.—The patient is a dissipated-looking man, and says that he has been very intemperate, and has been in the habit of smoking to excess. Has always enjoyed good health. At present there is a well-marked psoriasis existing anteriorly and posteriorly on the body, being more extensively distributed in the latter situation. It also exists on the extensor surfaces of the upper and lower extremities, except on the left leg. The patches on the body are mostly circular, with well-defined margins, covered with firmly-adherent silvery scales,

which, when removed, leave a bleeding and exposed surface peculiar to psoriasis; in this situation the points of eruption vary in size from a half inch to an inch in diameter. On the extremities the eruption is more irregularly shaped, and has ill-defined margins; with that exception it partakes of the characters described as peculiar to the eruption on the body. Both elbows and both knees are affected with the disease.

The whole of the left leg is covered with an eruption of eczema, the character of it being that the whole surface is of a dusky-red hue, covered with loosely-adherent scales; there is intolerable itching of the part, shown by the excoriations; the skin is very greatly thickened, and, when it is scratched, the surface becomes moist.

He was ordered: *R.* Sol. Fowleri, 3ij; mist. rhei et sodæ ad 3iv. *M.* Teaspoonful three times a day, immediately after meals. For the eczema: *R.* Ungt. picis liq., 3ij; ungt. zinci oxid., 3vi., *M.*, was applied locally, and he was cautioned not to wash the eczematous surface.

In the above case we have a good example of the co-existence of psoriasis and eczema in the same subject, which is not of so uncommon an occurrence as one would suppose, and to which I have had occasion to refer elsewhere.¹

CASE VI. Chronic Eczema of both Legs of Several Years' Standing.—Mary G., aged fifty-three years, born in Ireland, widow. She says that about twenty-four years ago her right leg was affected by an eczematous eruption, caused by being wounded with a rusty nail; this healed up under treatment. Since that time, until five years ago, or about the time of her menopause, she was free from any eruption. At that time (five years ago) an eruption appeared in the same situation as before, and gradually spread until it occupied all the right leg and part of the left. She has always enjoyed good health.

June 20th.—At present the right leg, all surfaces, is the seat of chronic eczema rubrum, the limb being of a dusky-red color, very greatly thickened, presenting marks of scratching, and here and there are moist places, no doubt caused by the

¹ Campbell, "The Relations existing between Eczema and Psoriasis." "Archives of Dermatology," vol. iii., p. 311.

irritation. She has been wearing gutta-percha next to the diseased skin, which causes the surface that has been in contact with it to present a glazy and shining appearance. On the upper part of the leg, near the knee, where the gutta-percha has not been applied, the surface is scaly, and drier. The eruption extends over the dorsum of the foot, but the plantar surface is spared; on the foot the eruption is also dry and scaly. On the left leg, lower portion, is a circumscribed patch of diseased skin about three inches by four, and on the inner side of the left ankle is another smaller diseased portion of skin. The eruption here is more scaly in nature, the skin is very much thickened, and there are several excoriations. The patient says that the itching is so intolerable that she is often kept awake all night.

She was ordered, on the above date, *R. Liq. picis alkalin.*, to be applied every night with a flannel cloth, and after that to smear the surface over with *ungt. zinci oxid.*

25th.—There is a very great improvement; the itching is not so intense, and the patient can sleep better at night.

July 23d.—She has been following the same treatment ever since, with marked improvement. She was ordered to wash the limbs *once* with water, and then to continue the same treatment.

25th.—On account of the severe pain caused by the *liq. picis alkalinus*, it was ordered to be discontinued, and *R. Ungt. picis, 3 ij, ungt. zinci oxid., 3 vi., M.*, to be employed instead; also, *mist. rhei et sodæ*, one teaspoonful three times a day.

30th.—The patient was ordered to return to the original treatment.

August 6th.—Ordered the following, in addition to the local treatment: *R. Sol. Fowleri, 3 ij; mist. rhei et sodæ ad 3 iv. M.* A teaspoonful three times a day, immediately after meals.

10th.—Doing very well. The wash was stopped to-day on account of the irritation caused by it, and dilute *ungt. picis* used instead. Same internal treatment.

27th.—Has not used the wash since August 9th; the erup-

tion is gradually fading away. Ordered: \mathcal{R} . Ungt. zinci oxid., ungt. simpl., āā, \mathfrak{z} j, locally.

Here the improvement is mainly due to the continued use of a stimulating wash. Of course, the cure was somewhat hastened by the internal treatment, but in all probability the eruption would have disappeared with local treatment only. It is very important, also, to bear in mind, in all cases of eczema, and especially those of the chronic form, that the application of water tends rather to retard than hasten the disappearance of the eruption; therefore, in all forms of the disease, the patient should be directed to abstain from the application of water to the surface.

CASE VII. *Hyperidrosis cured by the Internal Administration of Sulphate of Atropia in Minute Doses.*—Charles W., twenty-eight years old, a native of the United States, occupation sailor. Has had profuse sweating all over the body, and especially of the hands and feet. He says that on the slightest exertion he perspires very greatly. He was ordered: \mathcal{R} . Atropia sulphat., gr. ss; aquæ, \mathfrak{z} vj. \mathcal{M} . One teaspoonful in water, three times a day. In *two weeks* from the time I first saw him the sweating was *entirely* suppressed.

CASE VIII. *Pemphigus treated by the Internal Administration of De Valangin's Solution of Arsenic and Cod-liver Oil.*—Robert M., six years of age, is a pale, delicate, and anæmic child, suffering from hip-joint disease. About nine months ago the child's mother noticed an eruption which made its appearance on the chin, in the form of bullæ; it gradually spread, until the entire body and extremities became involved. The child has been under treatment, and the disease improves slightly at times, but has never entirely disappeared.

July 16th.—At present a large bulla is to be seen under the left eye; it is filled with sero-purulent fluid, and is about the size of a large hazel-nut. On the nose, the lips, ears, on the right side of the face, but not on the left, and on the chin, are a number of bullæ, varying in size from a small pea to a walnut. These bullæ contain, in some cases, serum, in others a sero-purulent fluid, and still others have collapsed, forming

a crust, which in some instances, however, has fallen off leaving the surface denuded. The hairy portion of the scalp is not affected. Passing down to the neck and trunk, we find the same condition existing, the eruption being greater in extent on the sides of the body than anteriorly or posteriorly; the upper extremities are also covered with a bullæ eruption. The condition of the surface on the lower extremities gives the patient the greatest annoyance, because the continual irritation of the bullæ by the clothes causes them to rupture, and the surface becomes denuded. All surfaces of the feet are affected; the entire surface of the body is very thickly studded with cicatrices, the remains of old bullæ. The mother says that a crop of bullæ will make their appearance in three or four hours, the child being comparatively free from eruption previously.

He was ordered: *R.* Liq. arsenici chloridi, \mathfrak{z} ss; aquæ \mathfrak{z} ivss. *M.* A teaspoonful, in water, three times a day, immediately after meals; locally to apply ungt. zinci oxid., ungt. simp. $\mathfrak{a}\mathfrak{a}$.

21st.—Slight improvement; ordered to continue the same treatment, and, in addition, oleum morrhuæ, a teaspoonful three times a day.

August 1st.—Some new development of bullæ on the legs; continue same treatment.

8th.—Very much better.

31st.—He steadily continued to improve until the present time; now there are only a few bullæ, and some marks of the old eruption. The mother says that he has not been so well, as now, since the eruption made its appearance. Ordered to increase the dose of the arsenical mixture to eighty drops, three times a day.

This case is given to show the beneficial effects of arsenic in pemphigus, and not because there is anything peculiar about the disease itself.

Proceedings of Societies.

NEW YORK PATHOLOGICAL SOCIETY.

Stated Meeting, November 14, 1877.

Dr. E. G. JANEWAY, President.

Laryngeal Phthisis.—Dr. BEVERLY ROBINSON presented a specimen exhibiting phthisis of the larynx. The patient was a boy in the penitentiary, who was supposed to have died of œdema of the glottis. An examination by means of the laryngoscope was attempted, but without satisfactory success. The *post-mortem* examination showed the presence of superficial ulcerations of the larynx, but no sign of œdema. The lungs were the seat of chronic catarrhal pneumonia, and contained a gangrenous cavity. Dr. Robinson suggested tracheotomy in cases similar to the one presented, inasmuch as treatment could be used with more benefit to the organ when in a state of comparative rest. This view was approved of by Dr. LOOMIS. Dr. JANEWAY thought, however, that it was questionable whether the benefit derived would compensate the risks of the operation.

The specimen was referred to the Microscopical Committee.

Presentation of Cases of Arthritis Deformans.—Dr. E. C. SEGUIN presented two children, a brother and sister, aged respectively ten and twelve, suffering from arthritis deformans. The parents were healthy; but, of four children, three had the disease. Of these three, one was a boy and two were girls. The disease made its appearance in each of them at about two and a half years, and became progressive. The first joints affected were those of the last phalanges of the fingers. The deformity invaded in regular order the articulations, till the wrist was reached. A similar condition was found to exist in the feet and ankles. The patients were seen by Kussmaul, in Germany, who recognized the disease. The treatment pursued was to apply one pole of a galvanic battery to the nape

of the neck and the other to the hand in a basin of water. This was continued for five minutes. The different muscles of the forearm were then successively faradized. Only slight improvement followed the treatment. Dr. Seguin presented a drawing which exhibited the appearance of the deformed joints.

Dr. GIBNEY said that for three years he had under observation a case of arthritis deformans, which was at the time of report seven years of age. The disease involved all of the joints of the body, even those of the vertebræ and lower jaw. The treatment pursued was the administration of the iodide of potassium, and the use of galvanism, one pole being applied to the nape of the neck. Latterly no pain was complained of, but there yet remained stiffness in the joints.

Dr. JANEWAY referred to the case of an adult, an inmate of the Hospital for Incurables. All of the joints were involved, with the exception of one shoulder. The temporo-maxillary articulation was so much affected as to prevent the patient from using the jaw.

Exsection of Hip-Joint—Recovery, but Non-arrest of the Disease.—Dr. ERSKINE MASON presented a negro boy upon whom he had performed the operation of exsection of the hip-joint. The case was important, as it might, and would without investigation, be considered as a case of cure following the operation, whereas the disease still existed, though the patient was able to walk and run without any inconvenience. The history of the case was as follows: A. B., aged eighteen, was admitted to the Colored Home July 7, 1876. Six years previously he fell a distance of six feet. Immediately after the fall he was able to walk about, but within a short time he was laid up with trouble in his hip-joint. The disease ran through the usual stages, and ended in suppuration. At no time was there any pain in the knee. When he was admitted to the Home there were numerous sinuses leading to dead bone in and about the joint. Exsection was performed, when it was found that the disease involved the acetabulum. After the operation the patient was placed in Buck's extension, without any other apparatus. The patient steadily improved, and at the end of November was able to walk about. One month

later he was to all appearances well, with a shortening of one and a half inch. When he was shown to the Society there was nothing to indicate that he ever had any disease of the hip; the shortening was not perceptible. The motions of the joint, on sitting down, showed what seemed to be no special defect. Dr. Mason said that, with all these excellent results, there was by no means a cure of the disease. Around the hip there were fifteen sinuses leading to dead bone in the ileum. The joint was firmly ankylosed, and what was to all appearances sufficient motion at the hip, was nothing else than mobility of the pelvis. The case was examined closely on the table, and there could be no doubt that ankylosis of the hip existed.

Dr. GIBNEY had a boy under observation at the Hospital for the Ruptured and Crippled, that in many respects resembled Dr. Mason's case. The patient had his hip exsected in 1870, and so far improved as to be able to walk about. There were evidences of present disease in the ileum, manifested by a sinus at the outside and inside of the joint. There was no motion at the hip, but there was at the sacro-iliac synchondrosis.

Dr. Post saw in consultation, six years ago, a boy, aged ten, suffering from morbus coxarius. The thigh was flexed upon the body so as to bring the knee close to the chin. The patient was very much emaciated at that time. He was given an anæsthetic, and by *brisement forcé* the limb was placed in normal position. Subsequently the actual cautery was applied behind the trochanter, and after six months the patient came to the city, and was to all appearances well. No deformity could be noticed. The boy died recently, and Dr. Post had an opportunity to inspect the joint. It was found to be firmly ankylosed.

Exsection of Knuckles to overcome Deformity.—Dr. Post presented the phalangeal joints of the index and little fingers, which he had removed from a girl under the following circumstances: Following a burn on the palm of the hand, cicatrization resulted in contraction of the fingers. The usual treatment was pursued, but it was found that it was impossible to straighten the index and middle finger without exsecting them. An incision was made in the median line and both

joints removed. Both fingers were then placed in proper dressings, and healed without any complication. It remained yet to be seen how much motion would result. The operation was similar to one performed over a year ago, and reported to the Society. In that case the metatarso-phalangeal joint of the great toe was removed.

Gangrene of Arm.—Dr. Post presented a specimen of thrombosis of the brachial artery, which was removed from a patient aged fifty-eight. Gangrene occurred in the left hand. The man had for a length of time suffered from cancer of the stomach.

Pericarditis, Pleuritis, Aspiration of Coagulable Blood, Difficulty of Diagnosis.—Dr. A. L. Loomis presented specimens showing evidences of pericarditis and pleurisy. The special interest of the case rested on the difficulty of diagnosis of pericarditis when there was pleurisy with effusion on the left side. An important phenomenon occurred in the treatment of the case, due to the removal of two ounces of coagulable blood.

The history of the case was as follows: A Dane, aged forty-five, was admitted to Bellevue Hospital October 17th. He had been addicted to stimulants, and one week before admission was attacked with a chill and fever. The next morning he was better, but during the day pain occurred in the left side. This was followed by difficulty in breathing. On admission, the patient seemed well nourished, but had an anxious facies. Temperature 103°; pulse 120, and feeble. He was examined by the house-physician, who detected fluid in the left pleura. There was also pneumonic expectoration. Two days after admission an attack of dyspnœa supervened, the respirations numbering 68 in the minute. He was again examined. There was found loss of motion on the left side. The apex of the heart was to the right of the median line. Percussion showed an area of flatness, which extended over the whole of the left side anteriorly, and also to the right of the median line. The heart-beat was feeble. Loud tubular respiration was heard over the left side behind, but not in front.

A diagnosis of pleurisy on the left side was made. The question of pericarditis was raised, but there was not sufficient evidence to decide upon the diagnosis. The house-physician

introduced an aspirator-needle to the extent of two inches, and withdrew two ounces of blood, which readily coagulated. Subsequently the needle was inserted, and fourteen ounces of serum aspirated. The fluid then ceased to flow. The aspiration relieved slightly the dyspnœa and cyanosis. The patient died October 27th.

Autopsy.—The pericardium showed the usual appearances of pericarditis in the state of serous effusion. There had been hæmorrhage into the fluid. The pleura contained clear serum.

Dr. Loomis said that it was difficult to make out the diagnosis of pericarditis with serous effusion when the patient had at the same time pleurisy on the left side. Had the patient been seen at the beginning of the attacks, there would not have been so much difficulty. An important question was, Where did the blood come from at the first aspiration? He felt that after the *post-mortem* there was as much mystery about it as before. It could not come from the tissue of the lungs, and it could not come from the pleura, as at the *post-mortem* the pleura contained clear serum. It might possibly have been derived from the pericardium. In regard to the stoppage of the flow of serum in the second aspiration, he might say that he felt inclined to discard the aspirator and use the trocar and canula, for within a short period of time he had seen three cases where no fluid could be withdrawn by the needle, although the patient had the chest full of fluid. An objection to the needle was, that its point was liable to injure any viscus that it touched, particularly if that viscus was in a state of motion, such as the pericardium.

Dr. JANEWAY had seen several cases where it was impossible to evacuate the fluid through the needle. He thought the causes were due either to a portion of skin or subjacent tissues getting into the needle, or, what was more common, some floating fibrine being drawn in the current and thus occluding it. When the needle was withdrawn, the shred of fibrine would be held by the walls of the chest, and thus, when the needle was removed, it would be found to be pervious.

Gouty Kidney.—Dr. BRIDGON presented a specimen of kidney removed from a patient who had long suffered from gout. The kidney contained cysts. The metatarso-phalangeal gout

of the great toe showed the peculiar cheesy matter found in gouty patients.

Cataract.—Dr. KNAPP presented a specimen of capsule of the lens, which was interesting from the fact that it was found in the incision of the cornea after removal of the lens. Dr. Knapp said that it occasionally happens that the capsule of the lens remains in the corneal incision and acts as a foreign body, causing failure of the operation. It was a wise precaution to closely examine the incision, and if any part of the capsule or iris was there caught, to push it back.

Transposition of the Vessels of the Heart.—Dr. JANEWAY presented the heart and lungs of a child who died when twenty-one months old. The child was cyanotic from birth, and suffered from catarrhal pneumonia. When fourteen months of age had an attack of coma lasting several days, which was followed by hemiplegia on the right side. This had considerably improved when death occurred. The child was able to say some words. On November 5th it was taken with pain in head and bowels, and the next morning passed a large amount of clotted blood. Death occurred seven hours afterward.

Autopsy.—The right ventricle was found to supply the blood to the system, and the left ventricle to the lungs. The foramen ovale was pervious. The brain was found to have undergone extensive degeneration; and it was interesting to note that the condition of the child, mental and physical, was so good with such a large deficiency in the cerebral tissue.

Stated Meeting, October 24, 1877.

Dr. E. G. JANEWAY, President.

Lipoma of Infant.—Dr. POST presented a large lipoma which he had removed from an infant eighteen months of age. The tumor existed upon the anterior part of the tibia, and was attached to the skin and deeper tissues. In the removal it was necessary to cut out a portion of the skin, as well as that part of the aponeurosis on which it rested.

Disease of the Knee-Joint—Amputation.—Dr. Post also presented the knee-joint which he had removed from a patient suffering from suppurative arthritis of different articulations. The case was reported in a recent meeting of the Society. The diseased joint proved to be not an available case for exsection, and it was decided to amputate. The external condyle was hollowed out into a mere shell, and in it was found a sequestrum occupying nearly the whole of the cavity. Dr. Post said that it was a very rare specimen. In regard to a second case of suppurative arthritis, also reported to the Society, Dr. Post said that he found that the disease involved the second shoulder, and he had found it necessary to remove from it a portion of diseased bone.

A second specimen of diseased knee was also presented. The patient was a woman, aged twenty-six years, who fell on the ice ten years previously, and hurt her knee. She was seen in August, when she entered the Presbyterian Hospital, and it was then found that several sinuses existed in the proximity of the joint. The actual cautery was applied, and the patient did well for five weeks, but at the end of that time fever came on, the temperature being 106° . It was considered wise to amputate. Degeneration was found to exist in the synovial membrane. There was also extensive suppuration of the soft parts after the operation. The patient did well.

Exsection of Elbow-Joint for Deformity.—A boy aged eight years came under observation, with his elbow firmly ankylosed in an extended position, the result of a chronic abscess over the olecranon process. Caries was found in the elbow, but not extensive. Exsection was performed. No complication occurred, with the exception of a free hæmorrhage at the end of the first week.

MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

Seventy-second Annual Meeting, October 22, 1877.

New Sphygmograph.—Dr. A. H. SMITH presented to the Society a new sphygmograph, the invention of Dr. Pond, of Ver-

mont. The instrument is easy of adjustment to the radial artery, and seems a marked improvement on the old forms of the sphygmograph. It consists essentially of a glass tube containing a fluid, which is separated from the pulsating artery by a thin diaphragm of rubber. The upper end of the tube is free, and allows the column of fluid to act on a lever which registers on a sheet of smoked mica carried forward by a watch-attachment. The advantages of the instrument are, its portability, ease of application, and delicacy in registering the pulse-beat.

Death of Dr. Crosby.—Dr. E. R. PEASLEE recited an account of the last illness of the late Dr. Alpheus B. Crosby. He had been, seemingly, in his usual health shortly before his death, and first noticed an impairment of his vital powers, which he attributed to over-exertion, during the previous winter. His attention was drawn to his kidneys by noticing a certain amount of diuresis, and on examining the urine there was detected a large amount of sugar. Symptoms of nephritis made their appearance, and after a short illness the disease proved fatal. Dr. Peaslee said that he had known Dr. Crosby from his earliest years, and considered that he had been a victim to overwork, inasmuch as he was not only of a robust nature himself, but of a long-lived stock.

Dispensary Abuses.—Dr. G. H. MITCHELL read a paper on the above subject, setting forth in detail the abuses which flourish around the city dispensaries; the principal one of these being the gratuitous treatment of patients amply able to engage a private physician. He offered the following protest in the form of resolutions, which were carried, and referred to the *Comitia Minora*:

1. Against the unusual, unjustified, and unfair treatment of the profession in the regulation governing at least one of our leading hospitals, as being an advertisement, and tending to discount the service-values of medical men.

2. Against the unlimited and apparently increased distribution of medical charities to all comers, without proper investigation, and as tending to develop prodigality rather than prudence among the poorer classes.

3. Against the physician covertly using the dispensary

as a business exchange, tending thereby to lower the high standard of morals which befits the profession.

To meet and overcome these irregular practices, we desire to join together as an Association.

Adjourned Annual Meeting, November 5, 1877.

Dr. JOHN C. PETERS, President.

Is the Human Eye changing its Form, and becoming Near-sighted, under the Influence of Modern Education?—Dr. E. G. LORING, in his valuable paper, answered the above question in a very satisfactory manner, as far as his observation and experience went. He said that hereditary influence was an important element in the production of myopia, and, although statistics did not strongly indorse that view, he still held that legendary information should receive much credence. In regard to the influence of modern education, it was found that a larger proportion of those living in cities were near-sighted than those in country districts; and, moreover, in those cities where intellectual pursuits were greatest, the largest number of myopes were found. In savage nations near-sightedness was very infrequent, and it would seem, in some respects, that it was a result of education. While the intellectual classes in Germany showed a large proportion of myopia, it was not so found in those artisans who used their eyes on fine objects, as watch-makers and wood-engravers. In England, where there has always been great intellectual activity, by no means as large a ratio of near-sightedness had been detected as in Germany, and it became necessary to seek for other factors to explain the prevalence of myopia. Impaired nourishment, imperfect ventilation, together with a sedentary life, had a marked tendency in producing laxity of the tissues in general, including of necessity the coats of the eye-ball; and, with the tension which resulted from close application of the sight, there was a great probability of lengthening of the eye, or myopia, resulting. In New York the German children were found more often near-sighted than those of other na-

tionalities. Dr. Loring said that undoubtedly myopia was hereditary, but that in all probability it could under certain circumstances be developed; but he did not believe that of necessity it must increase in a nation engaged in literary pursuits. In the United States the normal eye predominated, and he thought it was due to the fact that the young were more in the habit of indulging in out-door sports than in Germany. The same was true of England. From a careful analysis of the myopic cases, it was found that between the ages of ten and fifteen the majority developed; or, in other words, at that time the tissues of the globe were most readily affected by strain of the muscles of the eye. It could be easily understood, under such an hypothesis, that the industrial classes were so little liable to near-sightedness, for they seldom reached the practice of the more intricate branches of their trade before their eighteenth year. In conclusion, Dr. Loring was of the opinion that, under proper precautions, the normal eye could be continued indefinitely. If children were not allowed to apply themselves too closely to their studies between their eighth and sixteenth years, and were, moreover, allowed the proper amount of out-door exercise, not much danger need be dreaded. It was important also to have the schools properly ventilated, and other hygienic conditions made as perfect as possible.

Dr. JOHN C. DALTON thought that children at the present time were educated beyond their capacity, and that a great error existed in the present system of instruction.

Dr. H. D. NOYES said that he was not in a position to enter into the subject in the manner Dr. Loring had done, and could only speak from the results of his professional experience. He had no suggestion to make concerning the thorough and valuable paper that had been read.

It had occurred to him that hypermetropia was of more frequent occurrence than myopia. He did not know, however, if any statistics had been prepared on the subject. The conclusion which Dr. Loring brought forward he thought to be very pertinent. The prolongation of the eye was in great part due to relaxation of the tissues. Myopia was of most frequent occurrence in weakly and non-robust people. He

thought it could be thus readily understood how the English, as a people, suffered so little from near-sightedness. The Americans, though not so robust, were wiry, and capable of enduring fatigue. He was in accord with Dr. Dalton in saying that the present scheme of education was imperfect; over-schooling was not always training. He thought that Dr. Loring's valuable deductions should be brought before the community at large, and particularly should be impressed on those who control the education of the young. Dr. Noyes asked that Dr. Callan be asked to give his experience in colored-school children.

Dr. PETER A. CALLAN said that Dr. Loring's paper was so exhaustive that but little remained to be said on the subject. He had made some observations on colored-school children, and found that myopia existed in one per cent. among those attending the primary schools, and three per cent. in the higher schools. He was disposed to consider defective school-hygiene as an important factor in the production of myopia.

He was of the opinion that, so far, proper statistics on myopia in England had not been prepared. Moreover, there was there a prejudice against the use of glasses, and a casual observer of the people might be given a wrong impression.

Dr. MITTENDORF thought the defective school-hygiene among the Germans was an important element in rendering myopia so prevalent.

Dr. SAMUEL B. ST. JOHN had noticed the fact that some families were characterized by myopia. In Germany, until recently, the old German text was used in the school-books, and, from the similarity of many of the letters, considerable tension of the eyes was necessary to distinguish them.

Dr. O. SULLIVAN took up the subject of school-hygiene, and was of the opinion that it would be difficult to find any place that was more defective in this respect than New York. The ventilation was insufficient. He had known instances where the windows of the school were alongside the water-closet. Moreover, the light, in many instances, was so poor as to require considerable straining of the eyes to make out the lessons.

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, November 1, 1877.

Dr. S. S. PURPLE, President.

Experiments on the Effects upon Respiration of Cutting Off the Supply of Blood from the Brain and Medulla Oblongata.—Dr. AUSTIN FLINT, Jr., read an important paper on the above subject, which appeared in the last number of the JOURNAL. The subject was discussed by Drs. John C. Dalton and E. R. Peaslee. Dr. DALTON said he regretted that Dr. Flint had not been able to perform the experiments before the Academy, as he had at one time intended.

Triturations.—Dr. H. G. PIFFARD read a paper on “Triturations,” comparing the ordinary pharmaceutical trituration of mercury and chalk with the trituration of mercurials with sugar of milk. From an examination of both under the microscope, he found that the sugar-of-milk preparation was to be preferred. He thought, moreover, that it would be wise to introduce many of the sugar-of-milk triturations into practice, and not leave them entirely to the homœopathists; particularly so, inasmuch as they were original with Baron Storck, and merely extensively adopted by homœopathists.

Annual Meeting, November 15, 1877.

Dr. S. S. PURPLE, President.

Dr. T. G. THOMAS read the address of the evening, upon “The Influences which are Elevating Medicine to the Position of a Science.”

Bibliographical and Literary Notes.

ART. I.—*The Ear: Its Anatomy, Physiology, and Diseases. A Practical Treatise, for the Use of Medical Students and Practitioners.* By CHARLES H. BURNETT, A. M., M. D., Aural Surgeon to the Presbyterian Hospital; Surgeon in Charge of the Infirmary for Diseases of the Ear. Philadelphia: Henry C. Lea, 1877.

THE appearance of this book is another proof of the rapidly-increasing amount of honest, valuable work that is now being done in the various branches of medical science in this country, and the author is especially to be commended for the time and space he has devoted to the consideration of the anatomy and physiology of the ear. In this respect the book is fully abreast with the recent discoveries made abroad, and will therefore take rank as a scientific treatise.

The work is divided into two parts, the first treating of anatomy and physiology, the second of diseases and their treatment. The parts are subdivided into sections, and the latter again into chapters.

Section I. treats of the external ear, including the auricle, external auditory canal, and membrana tympani. The latter is usually classed with the middle ear, though really belonging to both.

Chapter I., on the auricle, contains a good discussion of the resonant functions of the human auricle, with a condensation of two papers of the author upon the subject, with his conclusions that it is a resonator for high notes.

In Chapter II., on the auditory canal, a short account of the development of the temporal bone is well introduced. Race-peculiarities of conformation are noted, and attention is called to the large auricle and wide auditory canal found in negroes, as of interest in view of its possible connection with the musical talent which is so universally met with in this race. Mention is also made of a so-called function of the external auditory canal of causing wax and small foreign bodies to fall out from it.

In Chapter III. it is well noted that, whatever the color of the drum-head may be, it must always be modified by the physical conditions brought about by stretching a slightly-transparent membrane over a darkened cavity. A description of the inclination and curvature of the drum-head is carefully given, as well as of the pyramid of light upon it; and the causation of the latter, the conditions involved in its production, and the physical laws which come into play in explaining the optics of this spot, are well expressed. A quotation is given from the important results of Trautmann's investigations on the subject.

Section II. treats of the middle ear. The anatomy is very full, particularly in regard to the ossicula, and careful extracts are given from the papers of Urbantschitsch on the dimensions of the ossicula, and of Blake on their weight. A good suggestion is made in pointing to the importance of remembering the distribution of the blood-vessels in the tympanic cavity when the ear is to be leeches.

In speaking of the physiology of the middle ear, the author calls attention to the investigations of Urbantschitsch in regard to the physiological nature of certain tympanic bands, heretofore considered pathological, and which he proved to be the remains of an embryonic fold. The function of the round window is distinctly explained, and an account is given of the method of examination used by Burnett and others, as well as of Weber-Liel's experiments on the same subject, which seem to prove that the membrane of the round window may be set in vibration by sound-waves from the membrana tympani, conveyed through the air of the tympanum. On page 113, the use of the word "hindmost" is to be deprecated as awkward. In speaking of the anatomy of the mastoid cells, the author calls attention to the important fact, that in the child the septum dividing the mastoid cavity from the sigmoid sinus is very thick, and hence an inflammation is not likely to pass from the former to the latter, as it is in adults, where the septum is very thin.

Section III. treats of the internal ear. In Chapter I. is an exceedingly full account of the anatomy and physiology of the labyrinth and auditory nerve. Reference is

made to Hasse's suggestions as to the three probable functions of the aquæductus vestibuli. A very careful discussion of the views of Helmholtz and Hensen on the physiology of the cochlea follows, and quite a full report of Böttcher's investigations on the same subject. In connection with Mach's experiments, a fact is mentioned which agrees with Breuer's hypothesis. In experimenting with the suspended chair, if the occupant of the chair, during the revolution about its vertical axis, inclines his head suddenly forward, and as suddenly elevates his head at the moment when the revolution ceases, in those cases where the revolution has occurred from left to right an impression will be gained that a revolution is occurring from the right upward and to the left, and the person fears he will fall to the left. This proves that the position of the head is a measure of the sensation of revolution. Another result of Mach's experiments is the knowledge we have, either with the body at rest or revolved with constant velocity, of the direction of the resultant accelerating force without the assistance of the eyes. Reference is also made to Breuer's supposition of the part played by the otoliths as an organ, in connection with the macula acustica, for the perception of the position of the head at rest. This entire chapter is an exceedingly interesting and careful epitome of the experimental work that has been done in elucidating the physiology of the semicircular canals.

We now come to Part II., which consists of diseases and their treatment. Section I. opens with directions for the examination of patients, and a description of the instruments necessary thereto and the methods of their employment. Chapter II. is on sound, hearing, and tests of the latter, and contains a good description of the "deaf-points" of Urban-tschitsch, as well as the "deaf-fields" or triangles. These are explained by Berthold as phenomena entirely unconnected with the physiology of the ear, but due to the interference of the vibrations of the fork. There is also an account of Blake's experiments to ascertain the power of the ear to hear high musical tones, and the acoustic character of the vowels and consonants is considered.

Section II. treats of diseases of the auricle. In Chapter

I. there is a good account of the tubercular syphiloderm. In Chapter II., on morbid growths and injuries, there is a clear description of the two varieties of othœmatoma.

Section III. treats of diseases of the external auditory canal. In circumscribed and diffuse inflammation Magendie's solution of morphia is recommended as an anodyne application in the canal, when the pain is severe, even in children. Burnett also recommends the application of the principle of aspiration as a means of cleansing the swollen parts of the canal. After cleansing the ear as thoroughly as possible by syringing and the cotton swab, he has seen through the Siglé pneumatic speculum, as he has sucked upon the rubber tube attached to it, large drops of pus ooze out from the openings in the dermoid layer. It is thus possible, he thinks, to cleanse the deeper parts much better than by any other means. The author speaks highly of monochloro-acetic acid as an application to granulations.

In Chapter II. there is a good account of Wreden's keratosis obturans, and the diagnostic differences between it and impacted cerumen.

Section IV. treats of inflammation of the membrana tympani or myringitis. The use of the term "traumatic injuries" seems to us tautological.

Section V. is devoted to diseases of the middle ear.

In Chapter I., on acute catarrhal inflammation, the author, in speaking of tinnitus aurium as a symptom, considers that in general it may be explained by Theobald's "vascular theory," in which morbid vibrations are produced in the vessels of the internal ear, and then communicated to the nerve. But where there is no pressure in the labyrinth the tinnitus may be referred to defect in the sound-conducting apparatus. The frequency of acute aural catarrh in infants is referred to as worthy of more than ordinary comment.

In Chapter II. we come to the important subject of chronic catarrhal inflammation. The author prefers to retain the name "catarrhal" as descriptive of the several varieties of inflammation, because it is comprehensive, and denominates the essential nature of the disease. He calls attention to the probable implication of the sympathetic and other nerves in

the disease, as manifested by the flushing of the cutaneous surface adjacent to the ear. This occurs especially in the dry form of catarrh.

Chapter III., on the treatment of chronic catarrhal inflammation, is extremely good. In the outset the author insists upon the necessity of recognizing whether the inflammation is moist or dry, in order to avoid grave mistakes. He recognizes three conditions here: 1. A closed tube with an empty tympanum; 2. A pervious tube, with a full tympanum; and, 3. A union of the two forms in the same ear. He favors the use of the nasal douche when used properly, and gives accurate rules for its employment. The excision of the tonsils is regarded as only rarely necessary for the relief of deafness, for the latter is independent of enlarged tonsils, and when they are removed they are often succeeded by a return of the hypertrophied condition, much larger than at first. A good *résumé* is given of the work of Brenner, and others, in the application of electricity in the treatment of aural diseases.

Chapters V. and VI. are devoted to the subject of acute and chronic purulent inflammation of the middle ear. In the treatment of a chronic suppurative discharge by nitrate of silver, Burnett recommends strong solutions, but he makes no mention of a method of application which is neater than the solutions. This consists in fusing the crystals of the nitrate in a platinum crucible, and coating the end of a silver probe with a small button of the fused nitrate, and then cauterizing each suppurative point in the ear by carrying the probe down upon it.

In Chapters VII. and VIII. are considered the course and consequences of chronic purulent inflammation, and their treatment. Under this head is included an examination into the uses of the artificial drum-head, the object of which should be to overcome the retraction of the sound-conducting parts, and take off the pressure from the contents of the labyrinth.

The indications for incising the periosteum over the mastoid and trephining the process in disease of the mastoid cells are clearly given, and at the end of the chapter we have a valuable bibliography of the publications of fatal results of

neglected chronic suppuration of the middle ear, ranging from 1864 to 1876.

Section VI. takes up the subject of diseases of the internal ear. In Chapter I. we find primary and secondary inflammation, and under this head are included aural vertigo from chronic middle-ear catarrh, and also vertigo from secondary inflammation of the labyrinth.

In the chapter on morbid growths of the auditory nerve there is a detailed account of a case of sarcoma of both auditory nerves, with the results of the autopsy and microscopical examination of both cochleæ. This history is a very instructive one, as furnishing some points for guidance in differentiating between Ménière's disease and the vertigo associated with permanent alteration in the gait, which is very often observed in cases of cerebral tumor.

The final section of the book is devoted to a brief account of deaf-mutes, and the methods for their relief and education.

Dr. Burnett is to be commended for having written the best book on the subject in the English language, and especially for the care and attention he has given to the scientific side of the subject.

The publisher's work has been well done, as is all work that emanates from the house of Henry C. Lea. There are very few typographical errors, and most of the illustrations are exceedingly good. The work is printed on fine paper, and makes a handsome volume of more than 600 pages.

ART. II.—*Hospitals: their History, Organization, and Construction. Boylston Prize Essay of Harvard University for 1876.* By W. GILL WYLIE, M. D. 8vo. Pp. 240. New York: D. Appleton & Co., 1877.

THE author of this volume has taken so much pains to familiarize himself with the different plans of hospital construction and the management of hospitals, both at home and abroad, together with statistics of mortality, relative expenses, etc., that he may fairly be considered an authority upon the subject. While we have failed to discover much that is new

in the book, the author has written a very good essay, giving us the history of hospitals and all the instruction necessary for building and managing them.

The author thinks that hospitals should be constructed with reference to accommodating four classes of patients. The first class includes the non-infected cases and those not liable to become infected; the second includes the non-infectious, but which are liable to become infected, such as slight wounds; the third class is the same as the second, only being of a more severe grade, like sloughing wounds or burns; the fourth class includes all the infectious and contagious diseases, as pyæmia, erysipelas, etc. The style of building best adapted for hospital purposes, in his estimation, is the one-story, single-ward (30×100 feet) pavilion; and very good reasons are given for this view. "In answer to the question, 'Should the *wards* (not the entire pavilion, for we have the service-rooms in a separate building) be permanent, or temporary, in character?' we would suggest that the pavilions for the first and second classes of cases enumerated be permanent in character, but that those for the third class should be more or less temporary; those for the fourth class, of course, to be frequently destroyed and renewed" (p. 99). The heating and ventilation are mainly effected by means of open fire-places within two shafts running from the foundation through the wards to the roof. Fresh air is admitted by means of a duct leading from outside to a warm air-chamber in the shaft, thence opening into the room three feet above the floor.

There is a good deal in the book which we have not space to refer to, and we can heartily recommend it for the perusal of all interested in sanitary reform, and for the guidance of those engaged in hospital construction.

ART. III.—*Fat and Blood, and How to Make them.* By S. WEIR MITCHELL, M. D., Physician to the Orthopedic Hospital and Infirmary for Diseases of the Nervous System, etc., etc. Philadelphia: J. B. Lippincott & Co., 1877.

IN a little hand-book of about a hundred pages, which has the appearance of being well adapted to the non-professional

reader, Dr. Mitchell gives the details of his method of treating weak, nervous, anæmic patients. In a valuable paper, published in 1875, on "Rest in the Treatment of Nervous Diseases," the author gave a brief sketch of a treatment he had found eminently successful in such cases, and additional experience has confirmed his opinion of its value. We can only say here that the essence of the treatment, which the reader will find very fully described in the work before us, consists of rest in bed, massage, certain forms of diet, and electricity. The results obtained in some apparently hopeless cases of broken-down or hysterical women are certainly remarkable. The system of diet Dr. Mitchell has found conducive to the accumulation of fat and blood is worthy of careful study, and we recommend every physician to read the book.

ART. IV.—*Cutaneous Venereal Memoranda*. By H. G. PIFFARD, M. D., Professor of Dermatology, University of the City of New York, etc., and G. H. FOX, M. D., Surgeon to the New York Dispensary. New York: William Wood & Co., 1877.

THIS is a compact and handy volume of 300 pages, of which 180, devoted to "Skin-Diseases," are from the pen of Dr. Piffard, and 120, given to "Venereal Diseases," are the work of Dr. Fox. After very short but satisfactory chapters on "Anatomy," "Physiology," "Pathology," "Symptomatology," "Diagnosis," "Nomenclature," and "Classification," the diseases are taken up in the order of the author's classification. The descriptions are necessarily brief, but clear; and the course, the diagnosis, prognosis, duration, and treatment of each affection are dwelt upon as fully as the space occupied would permit. We think, however, that greater attention to differential diagnosis and less to some pathological details would have made the book of greater value to students.

The chapters on "Venereal Diseases" are not quite so concisely written as the preceding ones. They may be said to contain all information essential to the purpose of the author—very well arranged, and agreeably expressed.

There are many practitioners who will find this book useful, and to students it ought to prove a very valuable aid.

ART. V.—*Alcohol; as a Food and Medicine.* A Paper from the "Transactions of the International Medical Congress," at Philadelphia, September, 1876. By EZRA M. HUNT, A. M., M. D., President of the Section of the American Medical Association on State Medicine and Public Hygiene, etc. New York: National Temperance Society and Publication House, 1877.

This essay presents in telling array all the available arguments against the use of alcohol as a food, and appeals to the profession to limit as far as possible the recommendation of its use as a medicine. The following are the author's conclusions:

1. Alcohol is not shown to have a definite food-value by any of the usual methods of chemical analysis or physiological investigation.

2. Its use as a medicine is chiefly that of a cardiac stimulant, and often admits of substitution.

3. As a medicine it is not well fitted for self-prescription by the laity, and the medical profession is not accountable for such administration, or for the enormous evils arising therefrom.

4. The purity of alcoholic liquors is, in general, not as well assured as that of articles used for medicine should be. The various mixtures, when used as medicine, should have definite and known compositions, and should not be interchanged promiscuously.

ART. VI.—*The Practitioner's Reference-Book. Adapted to the use of the Physician, the Pharmacist, and the Student.* By RICHARD J. DUNGLISON, M. D. Philadelphia: Lindsay & Blakiston, 1877.

THIS work contains an immense amount of information arranged with a view to easy reference. In it will be found everything relating to weights and measures, old and new;

everything of any practical value regarding doses, and a great variety of formulæ for special cases; everything that is useful about disinfectants; about poisons and their antidotes; about restoring the apparently drowned; about diet for infants and invalids; about the examination of urine, etc., etc. A copious index of diseases is given, with the appropriate remedies opposite each. The volume concludes with a minute account of the method of conducting a *post-mortem* examination. The object of the author has been to bring together in one volume a multitude of clinical facts and hints which are widely scattered through larger treatises, or to be found only in medical periodicals not easy of access. As a work of reference for the active practitioner it is all that the author claims for it.

ART. VII.—*A Course of Practical Histology: Being an Introduction to the Use of the Microscope.* By EDWARD ALBERT SCHÄFER, Assistant Professor of Physiology in University College, London. With Illustrations on Wood. Philadelphia: Henry C. Lea, 1877.

THE greater part of this little work is devoted to the methods of manipulating, preparing, and preserving the animal tissues for their study by the microscope. The directions given are clear, full, and explicit, and include the best and latest modes of injecting, hardening, cutting, staining, and mounting the various tissues. We know of no other volume which within the same compass (304 pages) gives nearly so much practical information of the kind, and we recommend it to the attention of all who are engaged, or about to engage, in microscopic work.

ART. VIII.—*A Practical Treatise on Materia Medica and Therapeutics.* By ROBERTS BARTHOLOW, M. A., M. D., Professor of Theory and Practice and of Clinical Medicine, and formerly Professor of Materia Medica and Therapeutics, in the Medical College of Ohio, etc. New and Enlarged Edition. New York: D. Appleton & Co., 1878.

THE demand thus early for a second edition of Dr. Bartholow's admirable treatise on Therapeutics is sufficient proof

that it possesses certain merits not found in other text-books. It has been adopted by most of the colleges throughout the country, and has already taken its place as a standard work on the branch of medicine of which it treats. In the new edition various omissions have been supplied, fifteen original articles have been added, and the author has availed himself of the criticisms of his reviewers to revise and render the work as complete as possible. We find it materially improved in many particulars.

ART. IX.—*An Elementary Treatise on Practical Chemistry and Qualitative Inorganic Analysis. Specially adapted for use in the Laboratories of Schools and Colleges, and by Beginners.* By FRANK CLOWES, D. Sc., Lond., Fellow of the Chemical Societies of London and Berlin, etc., etc. With Illustrations. From the second English edition. Philadelphia: Henry C. Lea, 1877.

THE title indicates sufficiently the character and purpose of this manual, which is simply a guide or text-book for a laboratory-course in chemistry. The first edition was the result of many years' experience with pupils in laboratory-work, and proved so satisfactory that it was speedily exhausted. It has the advantage over other text-books of fullness and detail in all the methods described, enabling the pupil to accomplish more without personal aid and explanation.

ART. X.—*An Index of Diseases and their Treatment.* By THOMAS HAWKER TANNER, M. D., F. L. S. Second edition. Revised by W. H. BROADBENT, Fellow of the Royal College of Physicians, etc. Philadelphia: Lindsay & Blakiston, 1877.

THE first edition of "Tanner's Index" has been for some time out of print, and the continued demand for the work led to the publication of a revised and improved edition. The general plan adopted by the late Dr. Tanner has been preserved, the editor of the second edition having restricted himself to such changes as seemed absolutely necessary, and to

the incorporation of new facts of unquestioned clinical value. The popularity of the work will probably now be greater than ever.

ART. XI.—*Walsh's Physicians' Combined Call-Book and Tablet. Walsh's Physicians' Handy Ledger.* By RALPH WALSH, M. D. Washington, D. C.

THESE two books are intended to be used together, the former as a pocket visiting-list and the latter as ledger. The "Ledger" is of a most convenient size, and its arrangement is very simple and compact. It will accommodate three hundred names, and present at a glance the amounts paid and due by each, for any length of time. It constitutes a complete system of book-keeping, especially adapted to those physicians who manage their own accounts.

The "Call-Book" for the pocket has been much improved.

ART. XII.—*The Spas of Aix-les-Bains and Marlioz, Savoy: their Physiological Action, Modes of Application, Clinical Effects, and Analysis; together with Practical Instructions.* By FRANCIS BERTIER, M. D., Paris, Physician to the Bathing Establishments of Aix-les-Bains, etc. London: J. & A. Churchill, 1877.

THESE spas have attained a considerable celebrity in Europe, and those interested in their therapeutical virtues will find full and trustworthy details concerning them in this work.

ART. XIII.—*The Pocket Case-Record and Prescription Blank-Book, with Visiting-List.* $3\frac{1}{2} \times 7\frac{1}{2}$ in. Pp. 176. Flexible cloth. Weight 4 ounces. *Office Case-Record and Prescription Blank-Book.* 8×11 in. Pp. 250. *Physicians' Case-Record Ledger.* Cap size, 9×14 in. *Physician's Case-Book, with Diagrams.* $8\frac{1}{2} \times 14$ in. Pp. 300. Cincinnati: Robert Clarke & Co.

THESE record-books will be found exceedingly convenient, and well adapted to the wants of the practitioner. The

“Ledger” is so designed that it may be used either as an ordinary physician’s ledger, with the usual visiting-lists of other publishers, or in connection with the “Pocket Record and Visiting-List,” in this way forming a perfect system of medical book-keeping.

ART. XIV.—*Wood’s Physician’s Vade-Mecum and Visiting-List*. Arranged and prepared by H. C. WOOD, M. D., Professor of Materia Medica and Therapeutics in the University of Pennsylvania, etc. Philadelphia: J. B. Lippincott & Co.

AMONG the numerous visiting-lists every physician should be able to find one to suit his taste and requirements. The one before us is very simple in its arrangement, and is evidently the result of practical experience on the part of its author. A series of diagrams is given, to aid in the application of electricity by marking the motor-points. The book also contains the decimal weights and measures, a list of poisons and their antidotes, and much other information in small compass.

ART. XV.—*How to Use the Ophthalmoscope*. Being Elementary Instructions in Ophthalmoscopy. Arranged for the use of Students. With 35 Illustrations. By EDGAR A. BROWNE, Surgeon to the Liverpool Eye and Ear Infirmary, etc. Philadelphia: Henry C. Lea, 1877.

NOTHING could be more clear and simple than Dr. Browne’s description of the ophthalmoscope and the best means of acquiring facility in its use. The chapter on optical principles is excellent, and is aided very much by the abundant illustrations.

ART. XVI.—*Practical Hints on the Selection and Use of the Microscope. Intended for Beginners*. By JOHN PHIN, Editor of the *American Journal of Microscopy*. Second Edition, fully illustrated and greatly enlarged. New York: The Industrial Publication Company, 1877.

THE second edition of this book has been enlarged by the addition of about thirty pages, and is a useful guide for those

beginning to work with the microscope, but it is not intended especially for medical students.

BOOKS AND PAMPHLETS RECEIVED.—Address delivered at the Third Annual Meeting of the Association of Alumni and Officers of the Medical Department of the University of Buffalo. By Frank H. Hamilton, A. M., M. D., LL. D. Reprinted from the "Transactions" of the Association.

The Treatment of Syphilis, with Special Reference to the Constitutional Remedies Appropriate to its Various Stages, the Duration of their Use, and the Question of their Continuous or Intermittent Employment. By Edward L. Keyes, M. D., Professor of Dermatology in the Bellevue Hospital Medical College, New York. Extracted from the "Transactions of the International Medical Congress," Philadelphia, September, 1876.

The Pathology and Treatment of Morbus Coxarius. By Lewis A. Sayre, M. D., Professor of Orthopedic Surgery and of Fractures and Dislocations in the Bellevue Hospital Medical College, New York. Extracted from the "Transactions of the International Medical Congress," Philadelphia, 1876.

On the Nature, Origin, and Prevention of Puerperal Fever. By W. T. Lusk, M. D., Professor of Obstetrics and Diseases of Children in the Bellevue Hospital Medical College, New York. Extracted from the "Transactions of the International Medical Congress," Philadelphia, September, 1876.

A Series of American Clinical Lectures, edited by E. C. Seguin, M. D. Vol. III. [Whole No. 29.] No. V. Points in the Diagnosis of Hepatic Affections. By E. G. Janeway, M. D., Physician to Bellevue Hospital, and Professor of Pathological Anatomy, etc., Bellevue Hospital Medical College. New York: G. P. Putnam's Sons, 1877.

Origin and Progress of Medical Jurisprudence. 1776-1876. A Centennial Address, by Stanford E. Chaillé, A. M., M. D., Professor of Physiology and Pathological Anatomy in the Medical Department of the University of Louisiana. A Reprint from the "Transactions of the International Medical Congress," Philadelphia, September, 1876.

Transactions of the International Medical Congress of Philadelphia, 1876. Edited for the Congress by John Ashurst, Jr., A. M., M. D., Fellow of the College of Physicians and Surgeons of Philadelphia, Professor of Clinical Surgery in the University of Pennsylvania, etc. Pp. 1153.

The Morphology of the Skull. By W. K. Parker, F. R. S., Hunterian Professor, Royal College of Surgeons; and G. T. Bettany, M. A., B. Sc., Lecturer in Botany in Guy's Hospital Medical School, etc. London: Macmillan & Co., 1877.

Variations in Type and in Prevalence of Diseases of the Skin in different Countries of Equal Civilization. By James C. White, M. D., Professor of Dermatology in Harvard University. Extracted from the "Transactions of the International Medical Congress," September, 1876.

A Treatise on Gonorrhœa and Syphilis. By Silas Durkee, M. D., Consulting Surgeon of the Boston City Hospital; Fellow of the Massachusetts Medical Society, etc. Sixth edition, with Eight Colored Illustrations. Philadelphia: Lindsay & Blakiston, 1877.

Address on Medical Biography, delivered before the International Medical Congress at Philadelphia, September 5, 1876. By J. M. Toner, M. D., of Washington, D. C. Extracted from the "Transactions." Philadelphia, 1876.

Viburnum Prunifolium (Black Haw). Its Uses in the Treatment of the Diseases of Women. By Edward W. Jenks, M. D., Professor of Diseases of Women and Obstetrics in Detroit Medical College. Reprinted from Vol. I, "Gynecological Transactions."

The Importance of Treatment of Aural Diseases in their Early Stages, especially when arising from the Exanthemata. By Albert H. Buck, M. D., of New York. From the "Transactions of the International Medical Congress," 1876.

The Columbia Hospital and Lying-in Asylum, a Government Institution. Its Past and Present Management. By a Citizen of Washington, D. C. From the October Number of the *Richmond and Louisville Medical Journal*.

Outlines of Modern Chemistry, Organic, based in part upon Riches's "Manuel de Chimie." By C. Gilbert Wheeler, Professor of Chemistry in the University of Chicago. Chicago: Jansen, McClurg & Co., 1877.

First Annual Commencement of the Training-School for Nurses at Charity Hospital, Blackwell's Island, under the Administration of the Department of Public Charities and Correction, September 13, 1877.

Transactions of the Kansas Medical Society, at its Annual Session held in Lawrence, Kansas, May 9th and 10th, 1877. Eleventh meeting since reorganization.

The New Departure in Medical Teaching. A Lecture delivered at the University of Michigan by A. B. Palmer, M. D., Professor of Pathology and the Practice of Medicine. Pp. 24.

Curiosities of Medical Experience on Staten Island. By W. C. Anderson, M. D. A Paper read before the Richmond County Medical Society, April, 1877.

On Harelip and Cleft Palate. By Francis Mason, F. R. C. S., Surgeon

and Lecturer on Anatomy at St. Thomas's Hospital, etc. London: J. & A. Churchill, 1877.

By-Laws of the Medical Society of the County of New York. Founded 1806. New York: Published by the Society, 1877.

Reports on the Progress of Medicine.

CONTRIBUTED BY DRs. GEORGE R. CUTTER AND EDWARD FRANKEL.

SURGERY.

Aneurismal Varix between the Left Brachio-Cephalic Vein and the Arch of the Aorta.—Zoja reports (*Annali Univers. di Med.*) a very important case. It is that of a voluminous tumor situated at the outer and upper side of the thorax, the size of the head of a fœtus at term, the examination of which during life permitted the generic diagnosis of aneurism of the arch. The attentive examination of the two tumors, the one intra and the other extra thoracic, says the author, and of their relations with the venous and arterial vessels of the thorax, renders manifest their nature and pathological origin. Properly speaking, they constitute but one tumor, to the production of which has concurred the sinking of the aorta on to the brachio-cephalic vein. This resulted in a gradual adherence, then the arterial current penetrated the vein through an ulceration or fistula formed in the walls become common to both. This process is that which has been frequently observed in other cases, and spontaneous aneurismal varices are not absolutely rare in the thorax. Nevertheless, the fact of a varix of the great brachio-cephalic vein produced by an aneurism of the aorta is certainly very exceptional, if not unique. It merits the attention of physicians and anatomico-pathologists, from the volume of the two tumors, the evidence of their spontaneous genesis, and the phenomena which were observed for a long time in the patient.—*Jour. des Sc. Méd. di Louvain*, August, 1877. G. R. C.

Treatment of Tetanus solely by Rest.—Prof. H. de Renzi, of Genoa, in *Gaz. Méd. de Paris*, 32, 1877, has addressed a letter to Prof. Botkin, of Russia, concerning the treatment of tetanus. In a large number of cases it appeared to him that rest alone was the only means by which the terrible sufferings could be relieved. The statistics of all authorities have demonstrated that the different methods of treatment hitherto employed have, in the large majority of cases, been powerless. He relates how, by a series of observations, he was led to perfect this method of treatment by rest, the usefulness of which is recognized, and to accomplish cures which previously he could not obtain with the most powerful remedies. In one case of tetanus, which died in spite of large doses of chloral, the effects of light were observed; the number and intensity of the attacks were almost doubled when the patient, previously kept in darkness, was exposed to light. The approximate proportion of paroxysms was ten in darkness, eighteen in full light. He instituted numerous investigations concerning the strychnine tetanus of frogs, which closely resembles idiopathic and traumatic tetanus, and found: 1. That tetanus is more intense in the frogs when placed in full light than in those kept in darkness. 2. That the spasms develop with greater rapidity and intensity in animals which are

agitated incessantly than in those which are kept quiet. The influence of mechanical stimulus is much more marked when aided by light. 3. That small frogs poisoned with one-twentieth milligramme of strychnia die easily if they are struck briskly, but may survive if they are left in perfect repose. Two cases of tetanus in man were treated in 1873; the first was treated with successive doses of chloral and repeated injections of curare, and died; the second, treated almost exclusively by rest, recovered. Of three other cases treated in 1874 on the same plan, only one died. Since then he further notes three recoveries out of four cases. One case recovered was one of strychnine tetanus, in which every attack produced symptoms of asphyxia. Another recovered case, with intense symptoms, had followed amputation of the little finger after injury. The third case was one of idiopathic tetanus following fever. The death of the fourth case is attributed by the author to the fact that in his absence the patient had not been kept completely isolated. In one of the three first cases the patient, who had bronchitis, was taken with great difficulty in expectoration and intense dyspnoea. The author thought that the absorption of oxygen and elimination of carbonic acid were impeded by the profound darkness of the room—according to Pettenkofer, whose experiments have proved that light facilitates the two acts of respiration. Accordingly, as soon as the patient was found to be out of danger, light was occasionally admitted into the room, and it was ascertained that then the number of respirations per minute was greater than when darkness prevailed. The author summarizes his plan of treatment as follows: 1. Placing the patient in a room perfectly dark, the door being opened only every four hours to bring and remove necessary articles. 2. Obliterating the auditory canal with wax, and advising the patient to keep as quiet as possible. 3. Administration of beef-tea, an egg, and two table-spoonfuls of wine every hour. 4. Belladonna and ergot for the relief of pain. 5. The floor should be carpeted.

E. F.

Case of Diaphragmatic Hernia and Perforation of the Stomach.—Dr. Klingelshofer, of Frankfort, reports the case of a young laborer, twenty-two years old, robust, who had always enjoyed health up to February, 1876, when a pneumonia confined him to bed for six weeks. A short time after he experienced a certain tendency to nausea and eructations, and sometimes vomited. On July 8, 1876, after having worked in the morning as usual, he ate a very hearty meal, and his voracity at the time attracted the attention of his comrades. In the afternoon he had *malaise*, followed by vomiting, which obliged him to quit work. He was then suddenly taken with such violent pain that he rolled on the ground, and could only be transported to his home several hours later. The author saw the patient at 8 p. m. the same day; found intense pain in the epigastric region, slight acceleration of pulse, extremities warm. Abdominal examination revealed nothing abnormal; no hernia. Thorax normal on percussion on right side; tympanitic on left. Absence of præcordial dullness; the pulsations of the heart were visible in the epigastrium. Cardiac bruits distinctly heard at the median line; to the right, puerile respiration; to the left, absence of respiratory murmur, no metallic bruit; on this side, effacement of intercostal spaces. The patient did not complain of oppression, the epigastric pain exceeding all other symptoms. Diagnosis: pneumo-thorax. The patient died the following morning, after presenting emphysema of the right side of the abdomen and thorax, and especially the right half of the neck. Autopsy: Pleuritic adhesions on the right side; no effusion. Right lung hyperæmic, but containing air throughout. On opening right half of thorax, air escaped with a distinctly hissing sound. The sternum being raised, at the inferior portion of the thorax was found a white sac which at first was taken for the pericardium, but

was found to be the stomach, which had penetrated into the thoracic cavity, through an opening in the diaphragm, together with the spleen, great omentum, and ten inches of the large intestine. The stomach was distended by gas, and contained a large quantity of food; it rose up to the level of the third rib. The left lung was entirely free from adhesion, and reduced by compression to the size of a fist. The stomach also showed a small perforation, about the size of a lentil, through which a large quantity of fetid matter had escaped into the thoracic cavity. The peritoneum was adherent to the anterior walls of the diaphragmatic opening, which measured two and three-quarter inches in length and two inches in width.—*Berl. kl. Wchschrft.*, 13, and *Gaz. Méd.*, 30, 1877. E. F.

Osseous Percussion.—Professor Lücke, of Strasburg, employs a new method for the examination of bones when diseased, by means of percussion. He has found that in percussing long bones there is a difference in sonorousness between the epiphysis and diaphysis: the sound in the former is more acute. In the same individual the sonorousness is the same in the bones of both sides. Hence the recently-consolidated callus of fractures, central osteitis, should give a weaker sound than normal. On the other hand, in a case of chronic arthritis of the knee, the extremity of the tibia affected with osteoporosis would give greater resonance than that of the other side. In order to distinguish these fine gradations of sound, the author recommends the practice of osseous percussion in the long bones where the resonance of adjacent cavities will not conflict. The sound is better elicited by raising the limb.—*Gaz. Méd. de Paris*, 26, 1877. E. F.

Miscellany.

The Therapeutical Society.—At a meeting held October 2d, at the house of Dr. Andrew H. Smith, a Therapeutical Society was organized, with the following members: Drs. E. R. Peaslee, A. L. Loomis, J. E. Janvrin, J. C. Peters, W. M. Polk, C. R. Agnew, L. M. Yale, A. Jacobi, J. R. Leaming, E. C. Seguin, W. H. Thomson, W. T. Lusk, E. R. Squibb, F. A. Snelling, H. T. Hanks, C. E. Billington, G. M. Smith, A. Flint, W. H. Draper, R. F. Weir, J. B. Hunter, T. A. Emmet, A. E. M. Purdy, B. Robinson, A. H. Smith.

This society will differ from most medical organizations in that the holding of meetings will form but a small and subordinate part of its plan. It is designed that each member shall be doing work for the Society in his daily round of practice. To this end precise and definite points in relation to the action of specified remedies under specified conditions will be given out, and the members will be expected to employ every opportunity which their practice affords, to accumulate accurate observations upon these points. The meetings will be

merely for the purpose of bringing these observations before the Society, and for laying out new work, both of which will be done through the agency of committees.

The following extract from the By-Laws will give an idea of the proposed method of working:

“The work of the Society shall be prepared by committees, or bureaus, of which a number shall be created, each one intrusted with the study of a group of remedies; as, for example, a committee on Antipyretics, one on Neurotics, one on Surgical Appliances, etc.

“New committees shall be formed at the request of any three members.

“Members may elect with which committee or committees they will serve.

“Each committee shall have its own organization.

“All communications shall be referred to the proper committee, or, in cases of great importance or urgency, to a special committee appointed by the President.

“The council shall determine what committee or committees shall occupy the time of a meeting, and the committee shall assign parts to its members.

“Each committee having an evening or part of an evening assigned to it, shall prepare a written report of its observations and conclusions, which, after being laid before the Society, shall be given to the Secretary for publication.

“Any member may submit a written statement of his experimental or clinical use of a remedy to the appropriate committee, and thereby become, temporarily, a member of said committee.

“Any committee may invite the attention of the Society at large to any point relating to its own branch, and call for observations upon such point.”

Printed copies of all the reports of committees will be furnished to each member of the Society.

The officers for the first year are: President, Dr. J. R. Leaming; Vice-Presidents, Drs. E. R. Squibb and J. C. Peters; Recording Secretary, Dr. A. H. Smith; Corresponding Secretary, Dr. E. C. Seguin; Councillors, Drs. W. H. Thomson and R. F. Weir.

It is proposed to limit the membership to forty.

The meetings will be held on the second Friday of February, April, June, October, and December, at 8 o'clock p. m.

The Late Drs. Stirling and Budd.—At a stated meeting of the New York Academy of Medicine, held October 18, 1877, a committee, consisting of Drs. F. A. Burrall and J. H. Anderson, presented the following resolutions, which were unanimously adopted :

Resolved, That in the sudden death of our late fellow, Dr. Thomas B. Stirling, this Academy recognizes the loss of an esteemed associate and a cultivated and faithful physician.

Resolved, That his acquirements were of a character to reflect credit upon the profession of which he was a respected and useful member.

Resolved, That we accept the admonition conveyed by the suddenness of his decease, and, while appreciating our loss, gladly bear testimony to the many virtues which adorned his character.

Resolved, That a copy of these resolutions be forwarded to his family, and also to the Managers of the New York Lying-in Asylum, to which institution he had rendered such faithful services.

Resolved, That a copy of these resolutions be sent to the medical journals of this city.

Also, a committee, consisting of Drs. Fordyce Barker and E. R. Peaslee, presented the following :

Resolved, That in the death of Prof. Charles A. Budd, M. D., the Academy of Medicine mourns the loss of one of its Fellows at that period of life when the mental powers are in their fullest vigor ; whose career as a medical practitioner, a hospital physician, and a professor in the Medical Department of the University of New York, had already won for him a reputation rarely attained except by a few at a more advanced period of life ; while his personal qualities had secured the warm friendship and high respect of those of his professional brethren who had the privilege of intimate acquaintanceship, and the devoted attachment and enthusiastic confidence of a large clientele.

Resolved, That the Academy shall record on its minutes this expression of their appreciation of the worth of its late Fellow ; and that a copy of these resolutions be published in the NEW YORK MEDICAL JOURNAL and *Medical Record*, and be transmitted by the Secretary to the bereaved widow of the deceased.

S. S. PURPLE, M. D., *President*.

H. T. HANKS, M. D., *Secretary*.

Appointments, Honors, etc.—Dr. F. R. Sturgis has been appointed House-Physician to the New York Dispensary. Drs. W. R. Gillette and A. Hodgman have been elected Resident Fellows of the New York Academy of Medicine. Dr. Wm. McNaughton Jones has been appointed Medical Superintendent of the British Columbia Insane Asylum. Prof. Sidney A. Norton has accepted the chair of Chemistry in Starling Medical College. Dr. R. W. Murphy has been elected to the California Legislature as one of the Representatives from San Francisco. The chair of Anatomy in the Cincinnati College of Medicine and Surgery is filled by Prof. Rothacker. Dr. W. W. Hester has been appointed Superintendent of the Kansas State Asylum at Ossawatimie. Dr. John Gerin has been appointed Assistant Physician to the Criminal Asylum, Auburn, N. Y., in place of Dr. Walter Channing, resigned. Dr. Richard Koch has been appointed First-Assistant Physician to the State Inebriate Asylum at Binghamton, and Dr. E. C. Kitchen Second-Assistant Physician. At the last meeting of the Canadian Medical Association Dr. Joseph Workman was elected President for the ensuing year.

At the Royal College of Physicians, the Lumleian Lectures for 1878 will be given by Dr. Bucknill, the Croonian by Dr. Pavy, the Gulstonian by Dr. Ferrier, and the Harveian Oration will be delivered by Dr. Burdon Sanderson. Dr. Cleland, of Galway, has been appointed to the chair of Anatomy in Glasgow University. Mr. Brudenell Carter has resigned the position of Surgeon to the Royal South London Ophthalmic Hospital. Mr. Thomas Annandale has been appointed to the chair of Clinical Surgery in the University of Edinburgh, made vacant by the resignation of Mr. Lister. Dr. P. Heron Watson, who had strong claims as Lister's successor, has been elected President of the Royal College of Surgeons of Edinburgh.

Journalistic Notes.—Drs. M. J. DeRosset and T. F. Wood, of Wilmington, N. C., announce the issue of the *North Carolina Medical Journal*.

A new journal, *The Practice of the Lake Region*, is au-

nounced by Drs. Clarke, Woodworth, and Myers, of Fort Wayne, Indiana.

The *Arkansas Medical Record*, a monthly journal, will appear January 15, 1878. It will be edited by James I. Hale, Little Rock, Arkansas.

We have received the first number, October, 1877, of the *The Australian Practitioner*, a quarterly journal of medical, surgical, and sanitary science, edited by Dr. Samuel T. Knaggs, Newcastle, New South Wales, and published by George Robertson, Sydney, Melbourne, Adelaide and Brisbane.

Injurious Effects of Galvanism.—In the *Boston Medical and Surgical Journal* of October 25th will be found a paper by Dr. D. F. Lincoln, in which he maintains that positive injury is often done by the application of the faradic current in the usual manner. He believes that harm may result even where there is a feeling of relief or increased vigor at the time, a period of decided lassitude succeeding. Reports of several cases are given in detail, in which the patients were rendered markedly worse by electrical treatment. Rheumatic arthritis, spinal exhaustion, muscular rheumatism, locomotor ataxia, and chronic myalgia, are the diseases Dr. Lincoln has found to be thus aggravated.

British and Foreign Medico-Chirurgical Review.—We learn with regret that Messrs. J. and A. Churchill have determined to discontinue the publication of this able quarterly, which for thirty-eight years has held a distinguished place in medical literature. The reason for thus abruptly terminating the career of a journal so widely known is the gradual decline in receipts from its sale, owing to the smaller demand for quarterly periodicals of any kind. The *Review* has been edited successively by Sir John Forbes, Dr. Parker, Dr. Carpenter, Dr. Sieveking, Dr. J. W. Ogle, and lastly by Dr. Arlidge. The journal concludes its existence with the number issued October, 1877.

The American Pharmaceutical Association.—At the twenty-fifth meeting of this Association, held in Toronto last Sep-

tember, the following committee was appointed to prepare the text of a new Pharmacopœia: Charles Rice, Chairman; F. Hoffman, Bedford Maisch, Remington, Bullock, Markoe, Sheppard, Hancock, Ebert, Diehl, Wayne, Crawford, Mohr, Painter, Saunders.

A vote of thanks was tendered Dr. Squibb for his earnest efforts to inaugurate an improvement in the plan of revision. The meeting was largely attended, and the proceedings were highly satisfactory to all concerned.

St. John's Hospital, Brooklyn.—From the *Proceedings of the Medical Society of the County of Kings*, we learn that the new building of this hospital is progressing rapidly. The general plan corresponds with that of St. Luke's, in this city, with the addition of many modern improvements. The size of the wards is one hundred by twenty feet, with a corridor of twelve feet. The hospital is sustained by the Protestant Episcopal Church, and is open to all of the Protestant faith. Drs. Dudley, Hutchinson, and Hopkins constitute the Advisory Medical Committee.

The Canada Medical Association.—The tenth annual meeting was held in Montreal, September 12th and 13th, under the presidency of Dr. Hingston, of that city. Many excellent papers were read, including one on "Tricuspid Stenosis," by Dr. R. P. Howard, of Montreal; one on "Excision of the Knee," by Dr. Fenwick, of Montreal; one on "Large Doses of Acetate of Lead in *Post-partum* and other Hæmorrhages," by Dr. Workman, of Toronto; and one on "Crime and Insanity," by the same gentleman. Dr. Workman, of Toronto, was elected president for the ensuing year. The meeting next year will be held in Hamilton.

Association of Superintendents of Insane Asylums.—The October number of the *American Journal of Insanity* devotes over two hundred and twenty pages to a report of the proceedings of the above Association. The thirty-first annual meeting was held in St. Louis, May 29th to June 2d, 1877. Dr. Charles H. Nichols occupied the chair. Forty-one super-

intendents were present as members, and a number of others by invitation. The next meeting will be held in Washington, D. C., on the second Tuesday in May, 1878.

Deaths from Anæsthetics in 1877.—We have recorded in our columns, during the present year, fourteen cases of death under anæsthetics. Ten of these deaths were from chloroform, one from ether and nitrous-oxide gas, one from methylene and ether, one from nitrous-oxide gas, and one from ether and carbonic-acid gas; the patient in the latter case (a man sixty-nine years of age, suffering from peritonitis) having for about thirty seconds inspired only his expired air.

Medical Society of the County of New York.—The following officers were elected at the annual meeting of this Society, held October 22d: Dr. John C. Peters, President; Dr. Isaac E. Taylor, Vice-President; Dr. A. E. M. Purdy, Recording Secretary; Dr. F. A. Castle, Corresponding Secretary; Dr. H. P. Farnham, Treasurer; Dr. H. G. Piffard, Censor; Drs. R. W. Taylor, D. H. Goodwillie, L. D. Bulkley, and G. H. Fox, Delegates to State Medical Society.

The University of Pennsylvania.—We are glad to learn, from the *Philadelphia Medical Times*, that the success of the new plan of teaching in this school, to which we alluded in our last issue, is fully equal to the highest expectations, the general paying-class being quite as large as it was last year. One hundred and thirty first-course students have entered for the three-year term. There is said to be a marked improvement in the character of the new class.

Students in the London Schools.—The total number of medical students entered in the various London colleges this season is reported to be one thousand eight hundred and thirty-seven—an increase of nearly two hundred over the number last year. St. Bartholomew's has the largest number—one hundred and fifty-eight. Guy's Hospital, St. Thomas's, and University College come next in order, the latter having only sixty-seven students.

A Venerable Journal.—Our esteemed contemporary, the *American Journal of the Medical Sciences*, having outlived a host of smaller and feebler journals, has attained its fiftieth year. During the greater part of its existence the *Journal* has been under the sole control of Dr. Hays, Sr. Of late years he has had the assistance of his son, Dr. I. Minnis Hays. Notwithstanding the opinion that quarterlies are not adapted to these impatient times, Hays's *Journal* bids fair to live and flourish for another half century.

New Medical Schools.—It is announced that a medical school will soon be organized in connection with the University of North Carolina, at Chapel Hill, where there was such a school in former years. Drs. T. W. Harris and W. P. Mallett have undertaken the enterprise, and have enlisted a number of prominent physicians in the work.—It is rumored that a medical college will shortly be established in Ottawa, Canada.

Dr. George R. Cutter.—We accidentally omitted to give Dr. Cutter credit for the very full and interesting synopsis of Dr. W. Boeck's work on "Syphilis," published under the "Bibliographical and Literary Notes" in our last issue. So complete a summary of the distinguished author's researches and conclusions renders a full translation of the work almost unnecessary.

Translations of American Books.—Dr. Stillé's work on "Therapeutics" is being translated into German. Dr. H. C. Wood's treatise on "Therapeutics" is about to appear in Italian. Dr. S. Weir Mitchell's work on "Injuries of the Nerves" has been translated into French, and will shortly be published in Italian also. Dr. Thomas's work on "Diseases of Women" will soon appear in Spanish.

Medical Instruction in Vienna.—According to the *Wiener med. Zeitung*, there will be in the University of Vienna, during the present season, fifty-three professors, forty-six privat-docenten, and twelve assistants. Connected with the General

Hospital there are fifteen clinics, six institutes, two museums, a library, and four dissecting-rooms.

Tracheotomy in Diphtheria.—Dr. A. M. Tupper reports, in the *Boston Medical and Surgical Journal*, a severe case of diphtheria, with invasion of the larynx, in a boy seven years old. Tracheotomy was performed on the eighth day, and the patient recovered. The tube was finally removed fourteen days after the operation.

Dartmouth Medical College.—The graduating exercises of this college were held October 30th, when twenty-four gentlemen were awarded diplomas. The Address of Welcome was delivered by Dr. C. F. Bonney, and the Valedictory by Dr. J. E. Pratt.

Dr. Brown-Sequard's Lectures.—The remaining lectures at Bellevue Hospital Medical College will be given December 1st, at 3.30 P. M.; December 14th, at 2.30 P. M.; December 15th, at 3.30 P. M. The profession is invited to attend.

Prize for Original Medical Work.—A prize of two hundred dollars has been offered by the Massachusetts Medical Society for an essay showing original or meritorious work within the two years prior to April, 1878, when the award will be made.

Alleged Cure of Hydrophobia.—In the *Medical Times and Gazette* of October 6th will be found a report of a case of hydrophobia said to have been cured by the subcutaneous injection of curare.

Liebig Memorials.—A statue to the celebrated chemist is to be erected in Munich, and another in Giessen. About thirty-five thousand dollars has already been subscribed for that purpose, and the list is closed.

Alumni Association of Bellevue Hospital Medical College.—At a stated meeting of the Alumni Association of Bellevue Hospital Medical College, held at Delmonico's, on the 2d of October, the following officers were elected for the year 1877-'78: John W. Pinkham (Class of 1866), of Montclair, N. J.,

President; Thomas W. Burchard (Class of 1872), of New York, First Vice-President; James R. Taylor (Class of 1874), of New York, Second Vice-President; George W. Wells (Class of 1868), of New York, Recording Secretary; Edwin D. Morgan, Jr. (Class of 1870), of New York, Corresponding Secretary; William H. Katzenbach (Class of 1871), of New York, Treasurer; F. A. Castle (Class of 1866), of New York, Historian (a permanent office). A Council of thirty-one members was also appointed, according to a recent amendment of the constitution, to hold office permanently, each class being represented, so far as possible, by its own members, one of the two being resident in New York.

Prof. Lewis A. Sayre offered a prize of two hundred dollars for the best essay submitted by an alumnus of the college upon "The Etiology and Pathology of Pott's Disease of the Spine," the award to be made by the professors of Pathology in the Bellevue Hospital Medical College, the College of Physicians and Surgeons, and the Medical Department of the University of the City of New York.—*Medical Record*.

Army Intelligence.

Official List of Changes of Stations and Duties of Officers of the Medical Department, United States Army, from October 14 to November 13, 1877.

By direction of the Secretary of War, a Board of Medical Officers is appointed to meet in New York City on the 7th day of November, 1877, or as soon thereafter as practicable, for the examination of Assistant Surgeons for promotion, and of candidates for admission into the medical staff of the United States Army.

Detail for the Board: Surgeons JOSEPH B. BROWN, JOSEPH H. BILL, and CHARLES H. ALDEN.

BILL, JOSEPH H., Surgeon.—Relieved from duty in the Department of the South. S. O. 223, A. G. O., October 30, 1877.

MURRAY, R., Colonel and Surgeon.—Assigned to duty as Medical Director of the Military Division of the Missouri. S. O. 220, A. G. O., October 25, 1877.

HAMMOND, J. F., Lieutenant-Colonel and Surgeon.—Assigned to duty in the Division of the Atlantic. S. O. 217, A. G. O., October 19, 1877. Granted leave of absence for six months. S. O. 227, A. G. O., November 6, 1877.

MCPARLIN, T. A., Major and Surgeon.—Assigned to duty as Attending Surgeon in New York City, relieving Surgeon Hammond. S. O. 217, C. S., A. G. O.

ALEXANDER, R. H., Major and Surgeon.—Relieved from duty in the Department of the Columbia, to proceed to Philadelphia, Pa., and, on arrival, report by letter to the Surgeon-General. S. O. 220, C. S., A. G. O.

FORWOOD, W. H., Major and Surgeon.—Assigned to duty as Post-Surgeon at McPherson Barracks, Atlanta, Ga. S. O. 175, Department of the South, November 3, 1877.

HARTSUFF, A., Major and Surgeon.—Relieved from duty in the Department of the Platte, and ordered for assignment to duty to the Division of the Atlantic. S. O. 220, C. S., A. G. O.

JAQUETT, G. P., Captain and Assistant Surgeon.—Assigned to duty at Fort Barrancas, Fla. S. O. 169, Department of the South, October 23, 1877.

BROOKE, J., Captain and Assistant Surgeon.—Relieved from temporary duty in the Department of the Columbia, and to return to his proper station in the Department of the South. S. O. 217, C. S., A. G. O.

GARDNER, W. H., Captain and Assistant Surgeon.—Assigned to temporary duty in the office of the Medical Director of this Department. S. O. 169, C. S., Department of the South.

SMART, C., Captain and Assistant Surgeon.—Relieved from duty in the Department of the Platte, to proceed to New York City, and, on arrival, report by letter to the Surgeon-General. S. O. 220, C. S., A. G. O.

BUCHANAN, W. F., Captain and Assistant Surgeon.—Assigned to duty at Chattanooga, Tenn. S. O. 176, Department of the South, November 6, 1877.

KINSMAN, J. H., Captain and Assistant Surgeon.—Relieved from duty in the Division of the Atlantic, and ordered to the Department of the Gulf. S. O., 224, A. G. O., October 31, 1877. Assigned to duty as Post-Surgeon at Mt. Vernon Barracks, Ala. S. O. 163, Department of the Gulf, November 4, 1877.

CRONKHITE, H. M., Captain and Assistant Surgeon.—Leave of absence extended one month. S. O. 124, Division of the Pacific and Department of California, October 11, 1877.

KIMBALL, J. P., Captain and Assistant Surgeon.—Assigned to temporary duty at Carlisle Barracks, Pa. S. O. 246, C. S., Division of the Atlantic.

FITZGERALD, J. A., Captain and Assistant Surgeon.—Assigned to duty at Fort Baise, Idaho Territory. S. O. 153, Department of the Columbia, October 18, 1877.

PATZKI, J. H., Captain and Assistant Surgeon.—Relieved from duty in the Department of the Platte. Ordered to New York City, and to report thence by letter to the Surgeon-General. S. O. 220, C. S., A. G. O.

ELBREY, F. W., Captain and Assistant Surgeon.—Relieved from temporary duty in the Department of the Columbia, and to return to his station in the Department of the South. S. O. 224, A. G. O., October 31, 1877.

MATTHEWS, W., Captain and Assistant Surgeon.—Assigned to duty at Camp Bidwell, Cal. S. O. 128, Division of the Pacific and Department of California, October 20, 1877.

COWDREY, S. G., Captain and Assistant Surgeon.—Relieved from duty in the Department of the Gulf, and ordered to the Department of the Platte for assignment to duty. S. O. 220, C. S., A. G. O.

DICKSON, J. M., Captain and Assistant Surgeon.—Relieved from duty in the Division of the Atlantic, and ordered to the Department of the Gulf for assignment to duty. S. O. 220, C. S., A. G. O.

MOSELEY, E. B., First Lieutenant and Assistant Surgeon.—Relieved from duty in the Department of the Gulf, and ordered to the Department of the Platte for assignment to duty. S. O. 220, C. S., A. G. O.

BARNETT, R., First Lieutenant and Assistant Surgeon.—Granted leave of absence for one month, with permission to apply for one month's extension. S. O. 166, Department of the Gulf, November 9, 1877.

SPENCER, W. G., First Lieutenant and Assistant Surgeon.—Relieved from duty in the Department of the South, to take effect on the expiration of his leave of absence, and ordered to the Department of the Columbia for assignment to duty. S. O. 224, C. S., A. G. O.

CORBUSIER, W. H., First Lieutenant and Assistant Surgeon.—Relieved from duty in the Division of the Atlantic, and ordered to the Department of the Platte for assignment to duty. S. O. 220, C. S., A. G. O.

SHUFFELDT, R. W., First Lieutenant and Assistant Surgeon.—To accompany companies of Fifth Cavalry to Fort D. A. Russell, Wyoming Territory. S. O. 126, Department of the Platte, October 29, 1877.

EDWARDS, L. A., Lieutenant-Colonel and Surgeon.—Died at Washington, D. C., November 8, 1877.

Obituary.

DR. PAUL F. EVE, one of the most distinguished surgeons in the South, died in Nashville, Tennessee, November 3d, aged seventy-one years. Dr. Eve was born in Augusta, Georgia, June 27, 1806, graduated at the University of Georgia in 1826, took the degree of M. D. at the Pennsylvania University in 1828, and afterward studied in Europe. He volunteered as a surgeon in the Polish Revolution of 1831; became Professor of Surgery in the Medical College of Georgia in 1832; in Louisville (Kentucky) University in 1849; in the University of Nashville, Tennessee, in 1850; and in the Missouri Medical College in 1868. In 1870 he was made Professor of Operative and Clinical Surgery in the University of Nashville.

In 1857 he was President of the American Medical Association; and during the war he served as a surgeon in the

Confederate Army. He is said to have crossed the Atlantic fourteen times, mainly with professional objects. He had remarkable success as a lithotomist. He had, up to 1874, ninety-two bilateral operations, losing only eight. Of the last forty-eight cases, only two died. He had also, during his professional lifetime, done a large amount of general surgery.

MARTIN PAINE, M. D.—This distinguished gentleman died November 10th, aged eighty-four years. Dr. Paine was a native of Vermont. He graduated at Harvard in 1813, and took his degree of M. D. from the same college in 1816. In 1841 Dr. Paine assisted in establishing the Medical College in connection with the University of the City of New York, in which he occupied the chair of Institutes of Medicine and Materia Medica. He was chiefly instrumental in procuring the repeal of the act to prevent dissection of the human body in this State. For the past twenty years Dr. Paine had been Professor Emeritus of Materia Medica and Therapeutics in the school he assisted in founding. He was the author of numerous works, among which are "The Cholera Epidemic of New York;" "Medical and Physiological Commentaries" (3 vols., 1840-'44); "Materia Medica and Therapeutics" (1842); "The Institutes of Medicine" (1847); and "The Soul and Instinct distinguished from Materialism" (1848), subsequently incorporated in the "Institutes."

PROF. CARLO LIVI, one of the most illustrious Italian alienists, and a physician of wide reputation, superintendent of the asylum in Reggio, died June 4, 1877, in the fifty-fourth year of his age.

DR. ALBRECHT ERLÉNMEYER, distinguished in psychiatry, died, in his fifty-fifth year, September last, at Bendorf, near Coblenz, where since 1849 he has had a large private asylum for mental and nervous diseases.

PROF. KARL RITTER VON HEINE, of Prague, distinguished as a surgeon and teacher of surgery, died recently of diphtheria, aged thirty-eight years.

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